

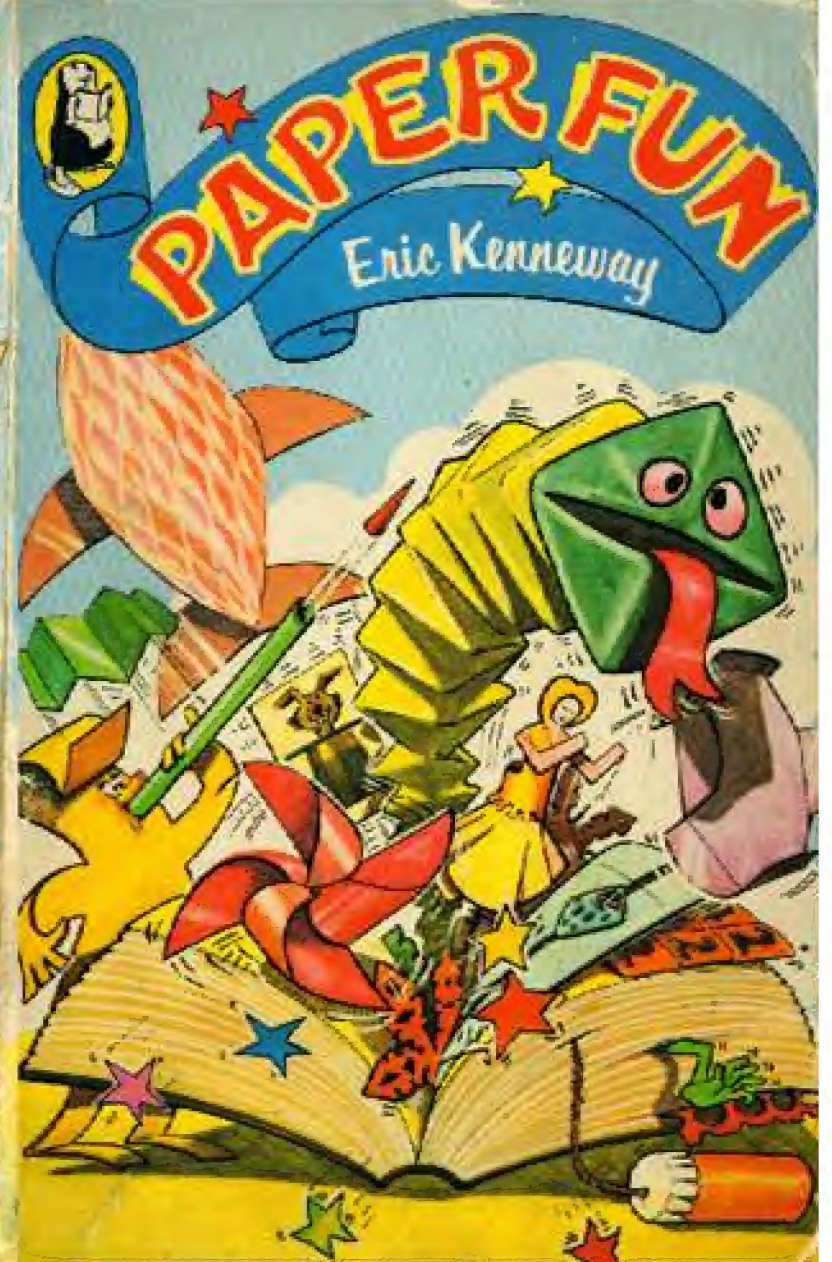
### A Beaver Original from Hamlyn

A paper refectory? Yes—it's as easy to make as the tinbee, totem pole and blowpipe and darts described in this book. There are toys, games, tricks, decorations and things to wear, and step-by-step instructions and line drawings show you how to make them all without any fuss or expense and with hours of fun.

Cover illustrations by Alan Rogers

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Illustrated by Alan Rogers



Beaver Books

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## ***Preface***

Here are toys and stunts, tricks and novelties that you can make yourself and enjoy with others. Each project begins with a short list of things you need to get started – often no more than a pencil, ruler, scissors and paper.

Decorate the paper toys with paints or coloured inks too, if you wish, and try to find other ways of improving them with your own ideas.

When you see the phrase ‘one sheet of paper’, note that it means here a sheet of good quality writing paper (not less than 20 × 25 cm in size). Do not expect necessarily to get as good a result by using, say, a page torn from an exercise book. It is made clear in the text when some kind of paper other than writing paper is recommended.

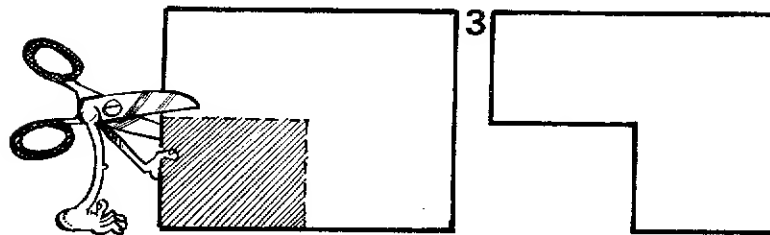
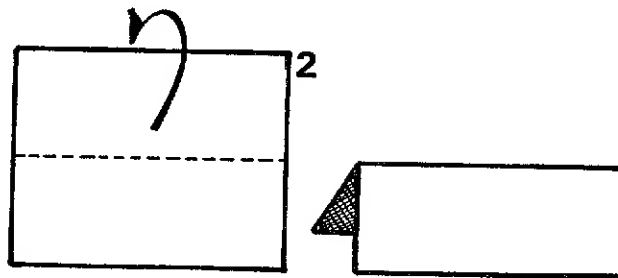
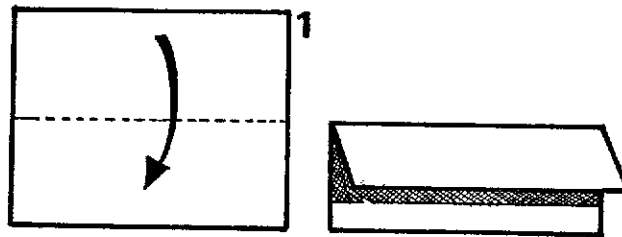
Most important, remember that cutting instruments, especially craft knives, can be very sharp. If you are using a craft knife, do your cutting-out on a piece of old board so that you don’t injure yourself or scratch any surfaces. Always keep your tools in a safe place, preferably a box with a lid, and make sure that they are out of the reach of small brothers and sisters.

Thanks to Fiona Caldwell, Alba Martin, Philip Noble and Toshie Takahama for sharing their ideas with me.

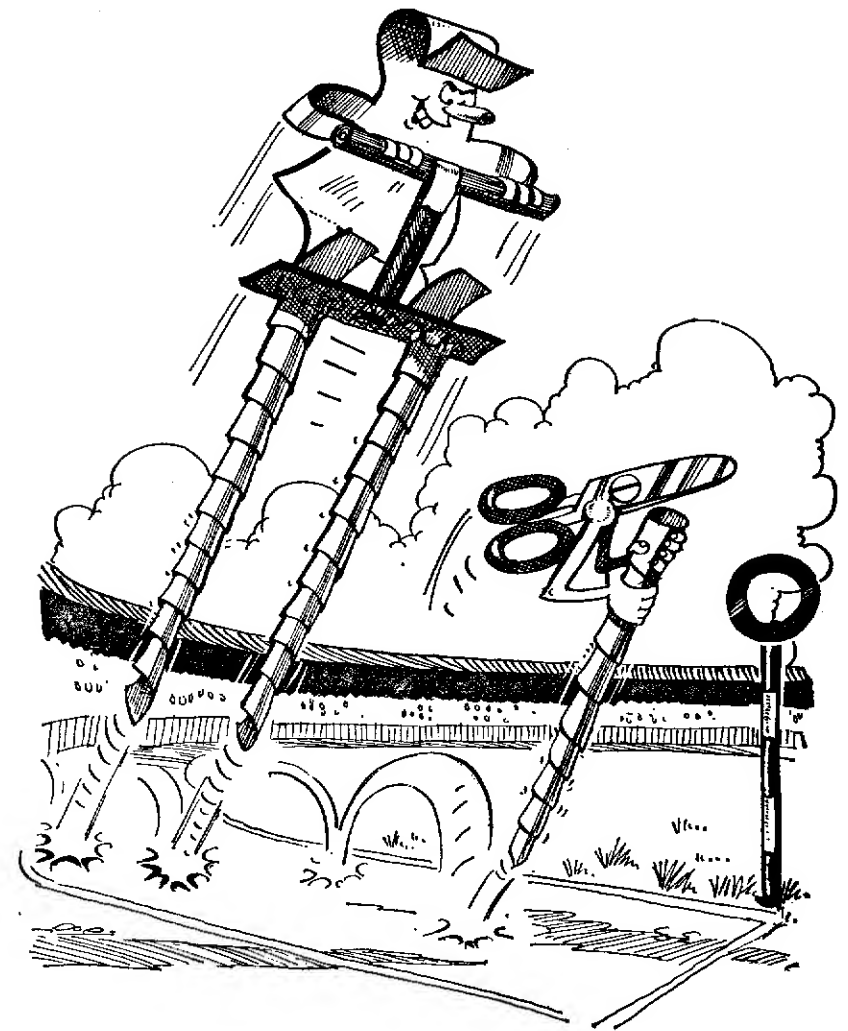
E.K.

## *A key to symbols used in the diagrams*

- 1 Fold forward.
- 2 Fold back.
- 3 Cut. Discard shaded area.



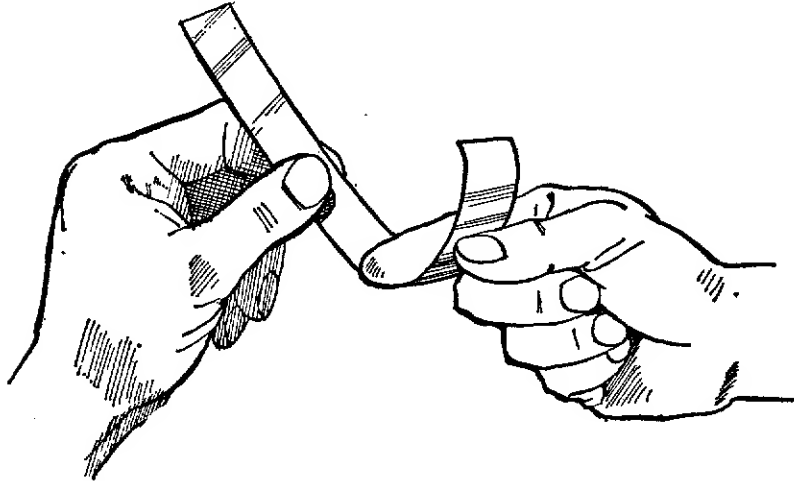
## SPRINGY TOYS



## Jumping spiral

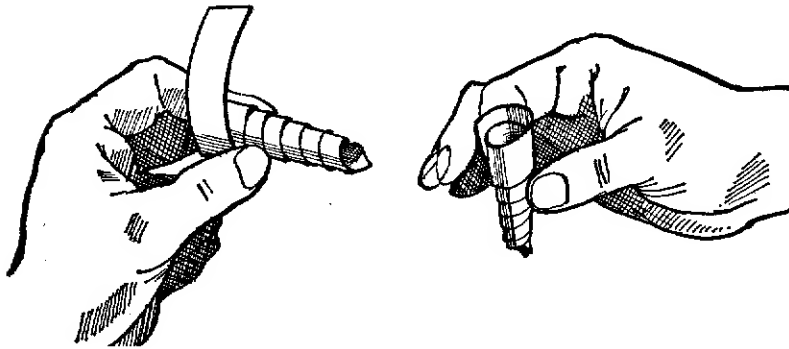
You will need: *one strip of paper (about  $2 \times 25$  cm)*

- 1 Curl the paper slightly by running it between the thumb and forefinger of one hand.



- 2 Then wind it into a spiral. Let the edges of the strip overlap by a few millimetres all the way along its length.

- 3 When the spiral is completed, stand it on a table, holding it between thumb and finger with the narrow end down. Press down into a coil and release. The spiral will jump into the air.

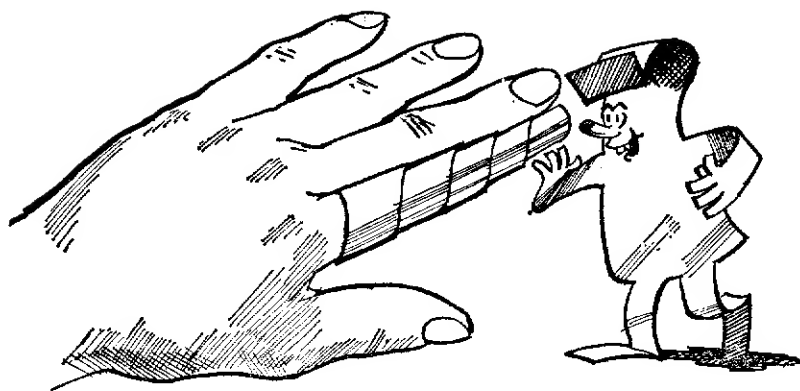


## Bandaged finger surprise

You will need: *one jumping spiral (as shown on page 10)*

- 1 Hold the point of the spiral against the tip of your left forefinger.

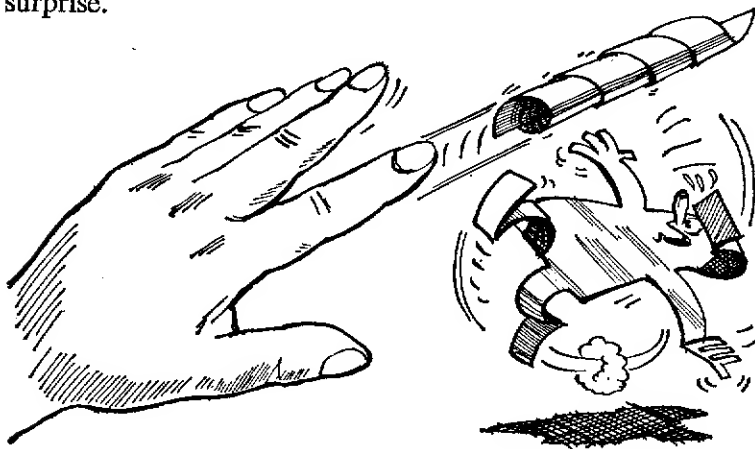




2 Compress the spiral and extend it the *other* way, pushing it back along your finger. Arrange it as neatly as possible and hold it in place by keeping your forefinger pressed against the finger next to it.

Now flourish your hand in front of a friend saying, 'Look what I've done to my finger!' He will probably assume that you are wearing a bandage.

3 Before he has a chance to inspect it closely, move your fingers apart and the 'bandage' will jump off, giving him quite a surprise.

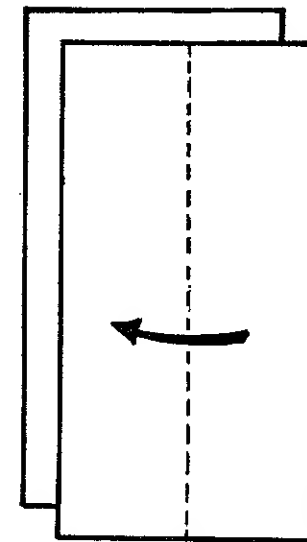


## High jump apparatus

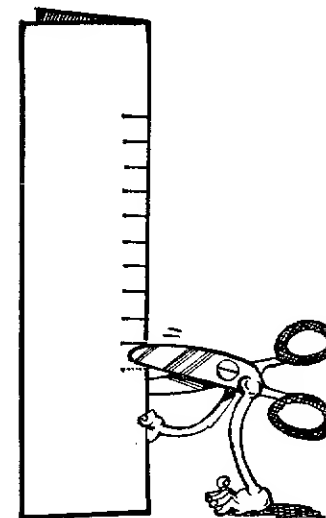
You will need:  
*one sheet of paper (20 cm long)*  
*one extra strip of paper*  
*pencil and ruler*  
*scissors or craft knife*  
*glue*

You can use this apparatus to test the power of your jumping spiral. Why not match your spiral against those of your friends in a jumping competition?

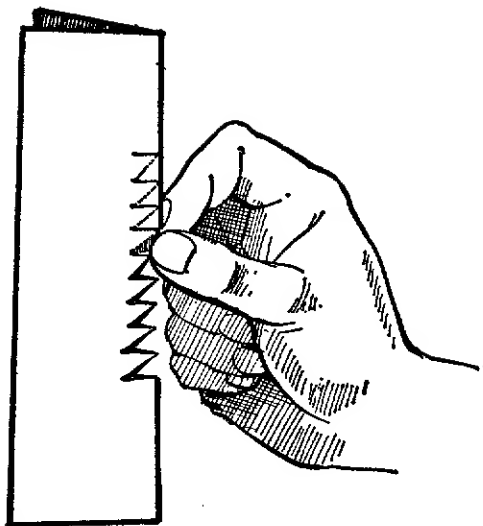
1 Cut the sheet of paper in half lengthways. Fold one of these pieces in half lengthways.



2 Start at a point about 5 cm from the bottom and mark ten 1 cm intervals up the folded edge. Then cut slits 1 cm deep at these points.





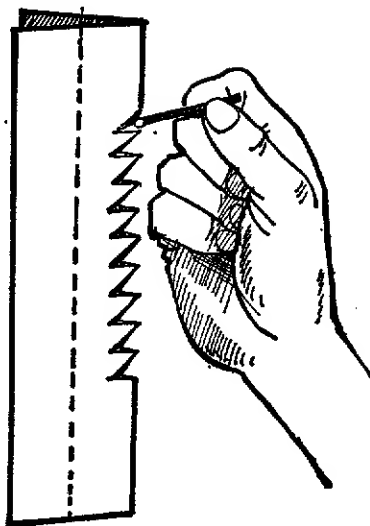


3 Fold each tooth-like projection back at an angle, making sharp creases ...

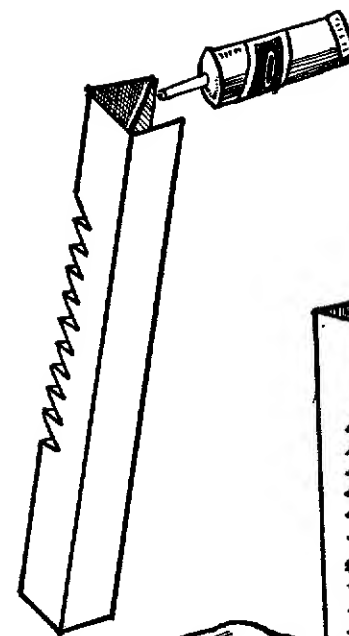


4 ... then push each point inside between the two layers of paper. It is easier to do this if you use a matchstick or the point of a pair of scissors.

In preparation for step 5, make a crease by folding the left edge to the right and back. Turn over and make a similar crease on the layer behind.

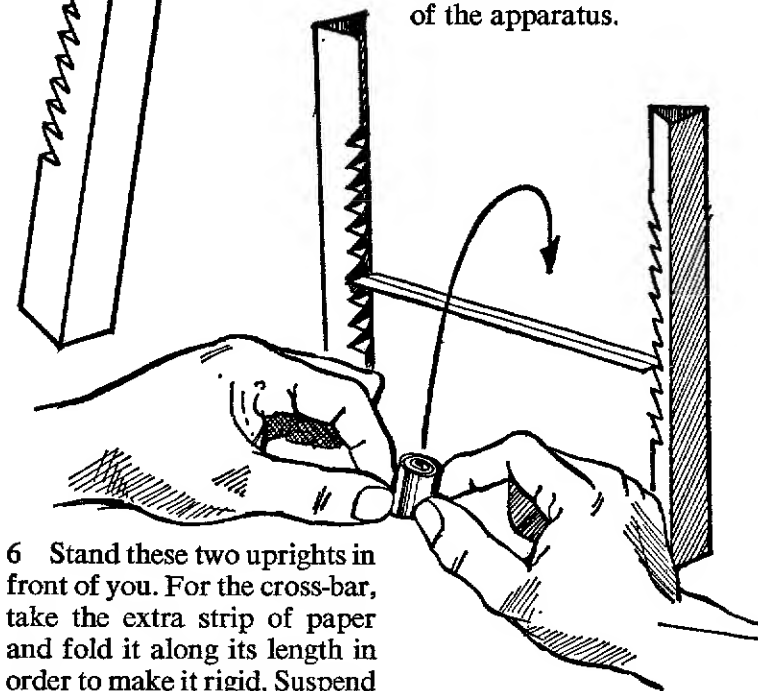


14



5 Overlap the two side panels and glue them together to make a sort of tube with a triangular cross-section.

Repeat steps 1-5, using the second piece of paper, to make another similar tube. These together will form the uprights of the apparatus.



6 Stand these two uprights in front of you. For the cross-bar, take the extra strip of paper and fold it along its length in order to make it rigid. Suspend the cross-bar between the uprights, resting each end on one of the little projections.

Now measure how high your spiral will jump. When you succeed at the lower levels, raise the cross-bar higher.

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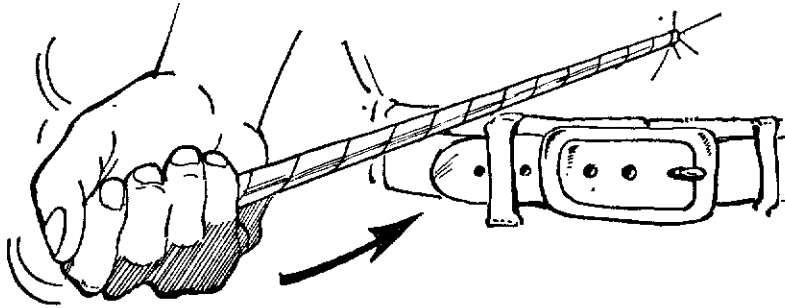
## Hara Kiri

You will need: *one strip of paper (2 × 50 cm at least)*

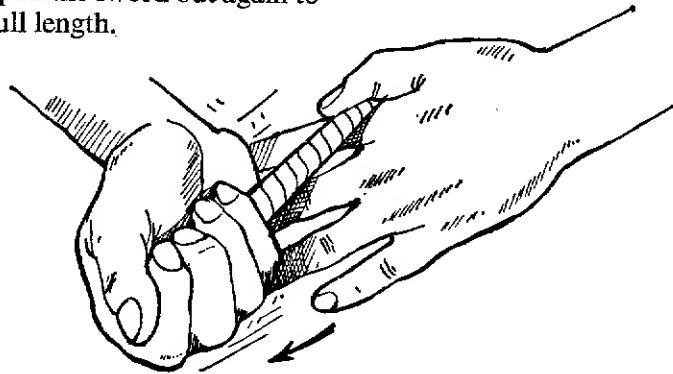
Use good quality paper: drawing paper or some kind of wrapping paper will do, but newspaper, for example, will not be springy enough.

Curl the strip into a spiral as shown on page 10. Use it as a sword. Stab with it and the point will appear to penetrate whatever is struck. (Actually, of course, it contracts within itself.)

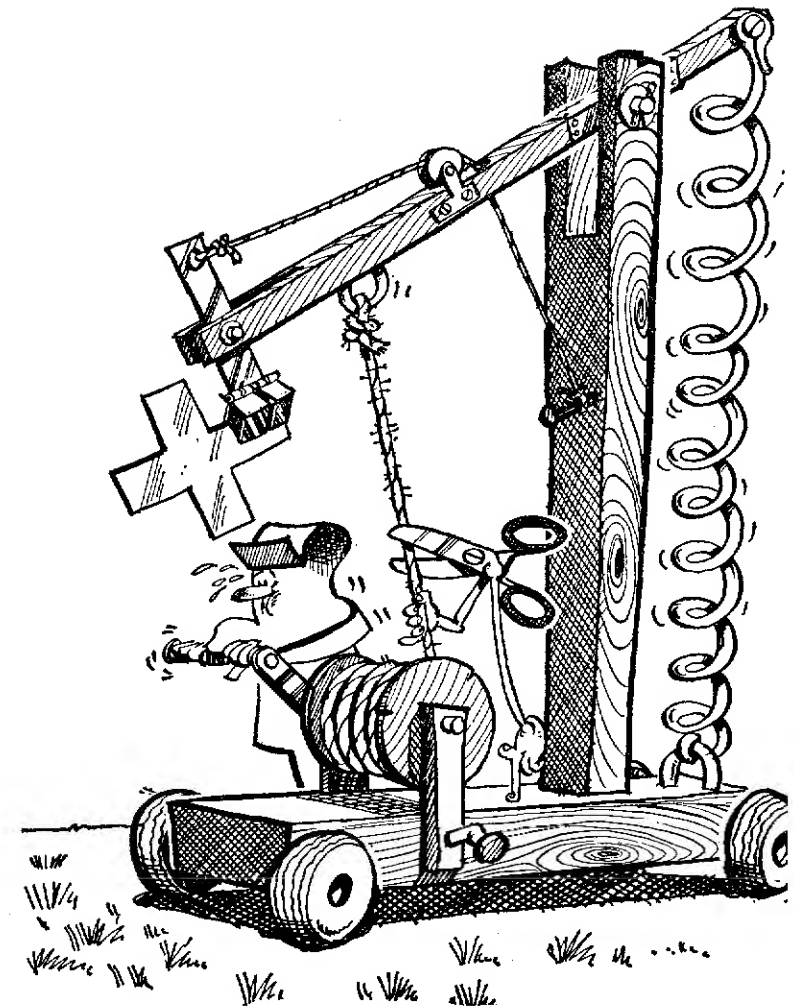
1 If you 'stab' yourself like this . . .



2 . . . by holding the tip, you can pull the sword out again to its full length.



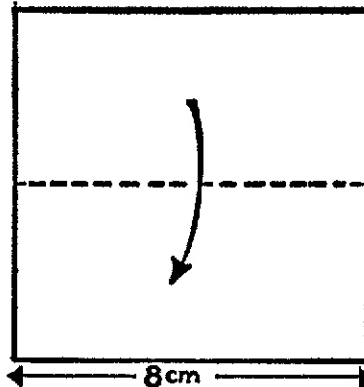
## THROWING TOYS



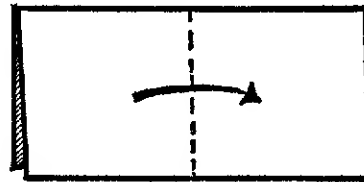
## Boomerang cross

You will need: *one sheet of paper*  
*pencil and ruler*  
*scissors or craft knife*

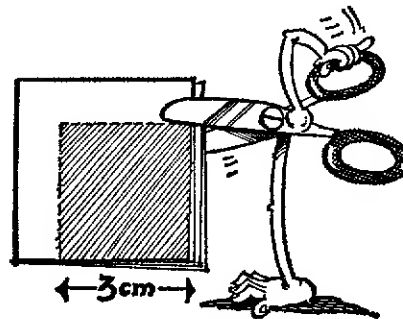
1 Prepare an 8 cm square.  
Fold the top edge to the bottom.



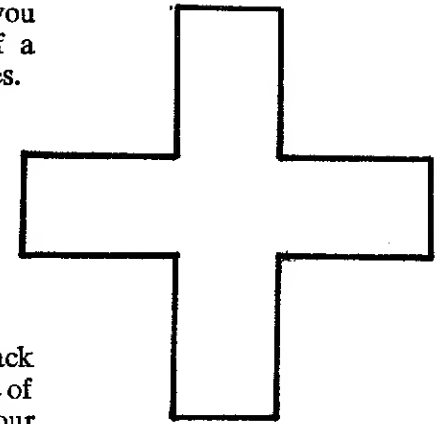
2 Fold the left edge to the right.



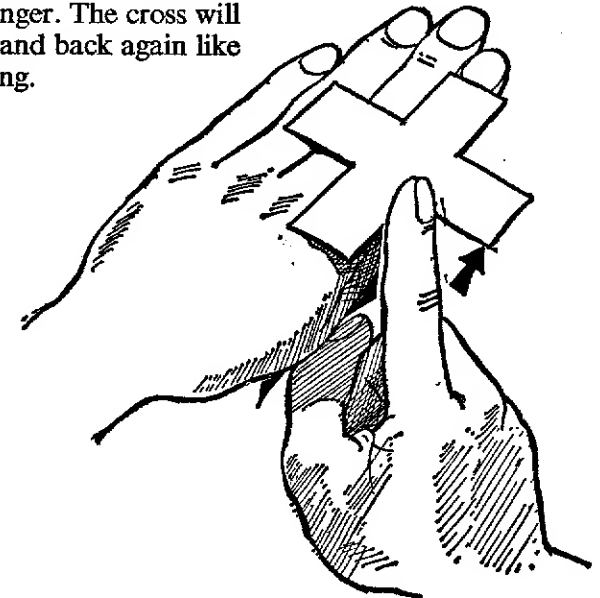
3 Measure 1 cm in from the left and down from the top. Draw these lines. Cut along the lines through all four layers and remove the shaded area.



4 Unfold the paper and you should have the shape of a cross. Smooth out the creases.



5 Place the cross on the back of your left hand so that one of its arms lies along your forefinger. Keeping your left thumb tucked out of the way, strike the edge of the arm which sticks out with your right forefinger. The cross will spin away and back again like a boomerang.

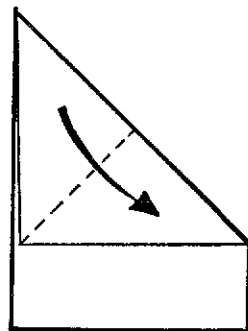
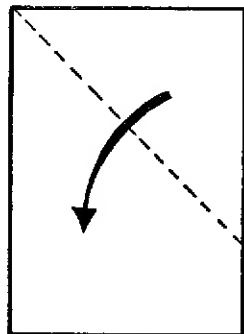


## Origami plane

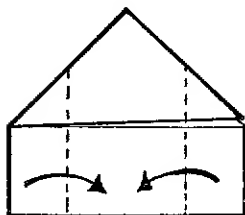
You will need: *one sheet of paper*

First fold the two longer edges together, crease and open out. This is to make the vertical centre line.

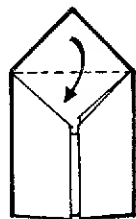
- 1 Fold the top edge to lie along the left edge.



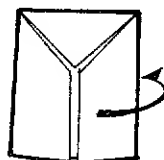
- 2 Fold the left edge to lie along the horizontal edge.



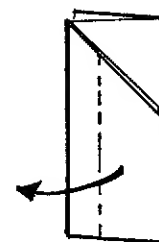
- 3 Fold the two sides to the centre.



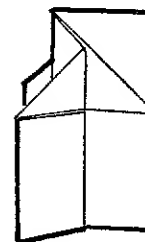
- 4 Fold the top point down.



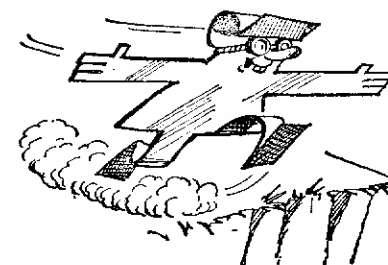
- 5 Fold in half behind.



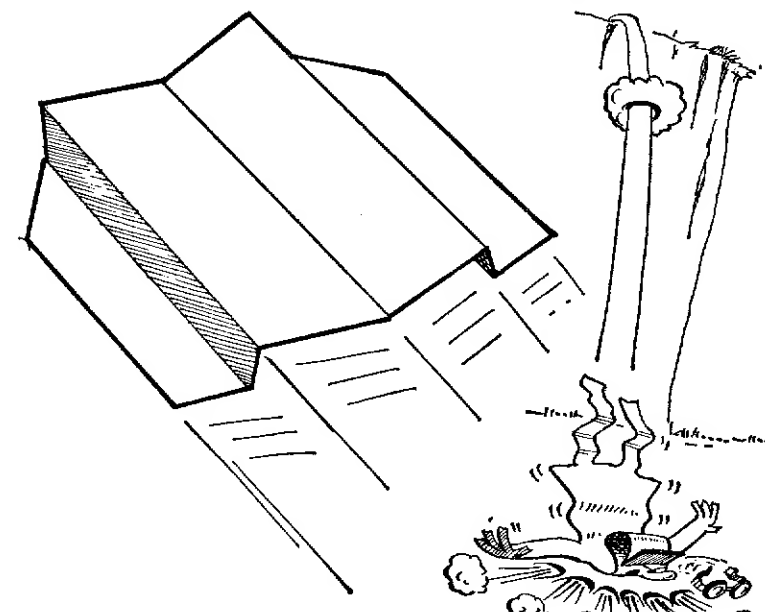
- 6 Fold the top flap to the left. Fold the rear flap in the same way ...



- 7 ... like this. Open out.



- 8 Launch the plane into the air and watch it fly.



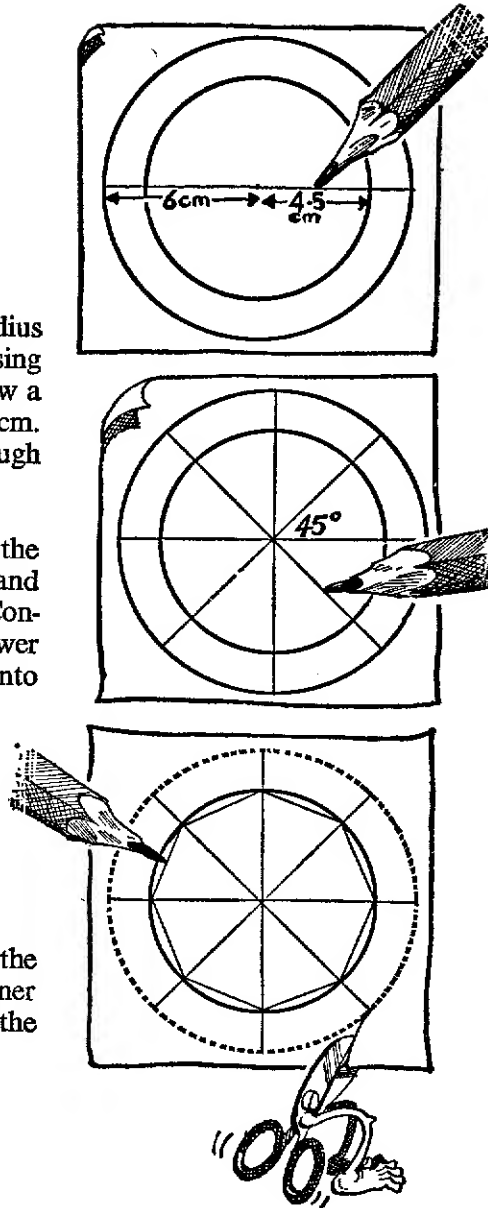
## Frisbee

You will need:  
*one sheet of paper*  
*pencil and ruler*  
*scissors or craft knife*  
*pair of compasses*  
*45° set square*

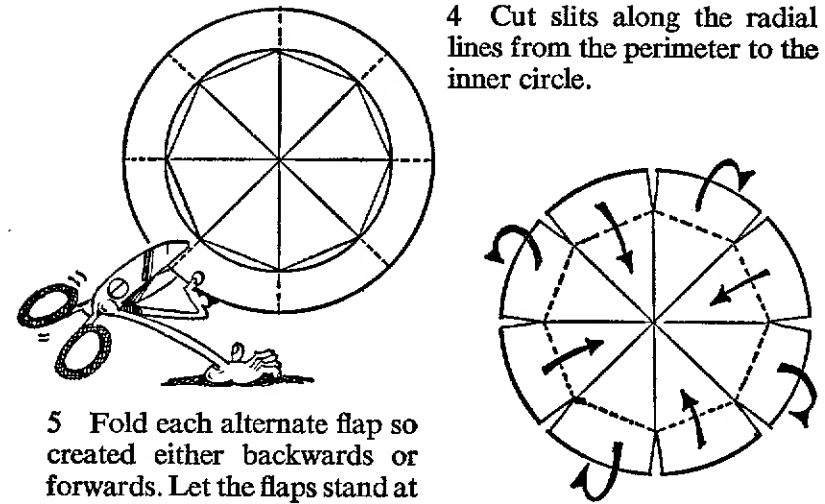
1 Draw a circle with a radius of 6 cm. Within that, and using the same centre point, draw a circle with a radius of 4.5 cm. Draw a horizontal line through the centre.

2 From the centre of the circles, draw a vertical line and two lines at angles of 45°. Continue these lines in the lower half to divide the circles into eight equal parts.

3 Join the points where the radial lines meet the inner circle. Then cut around the outer circle.

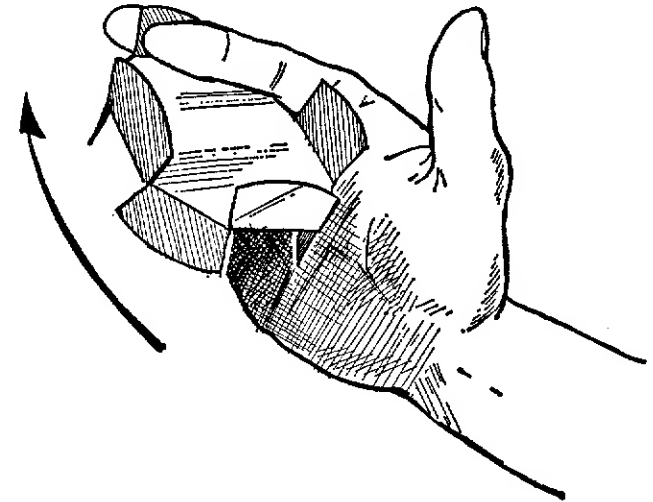


4 Cut slits along the radial lines from the perimeter to the inner circle.

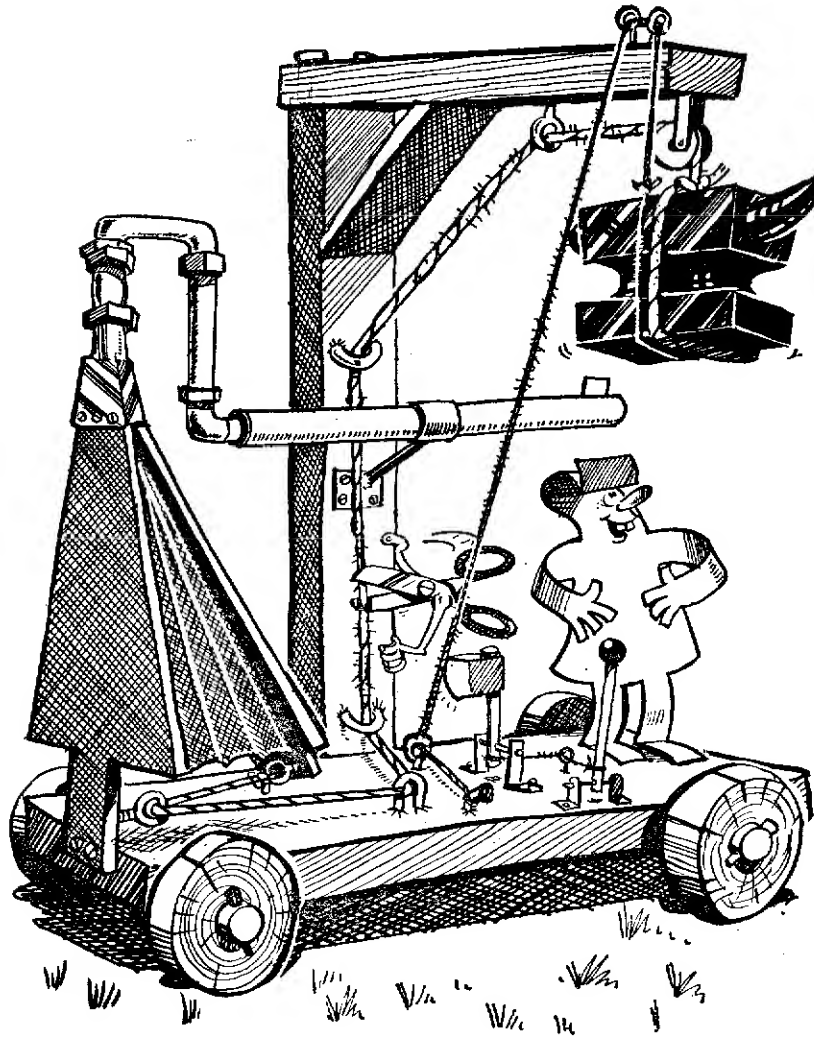


5 Fold each alternate flap so created either backwards or forwards. Let the flaps stand at 90° to the disc.

6 Grip one of the flaps between your forefinger and middle finger. Release by flicking your wrist forward; the frisbee will spin into the air.



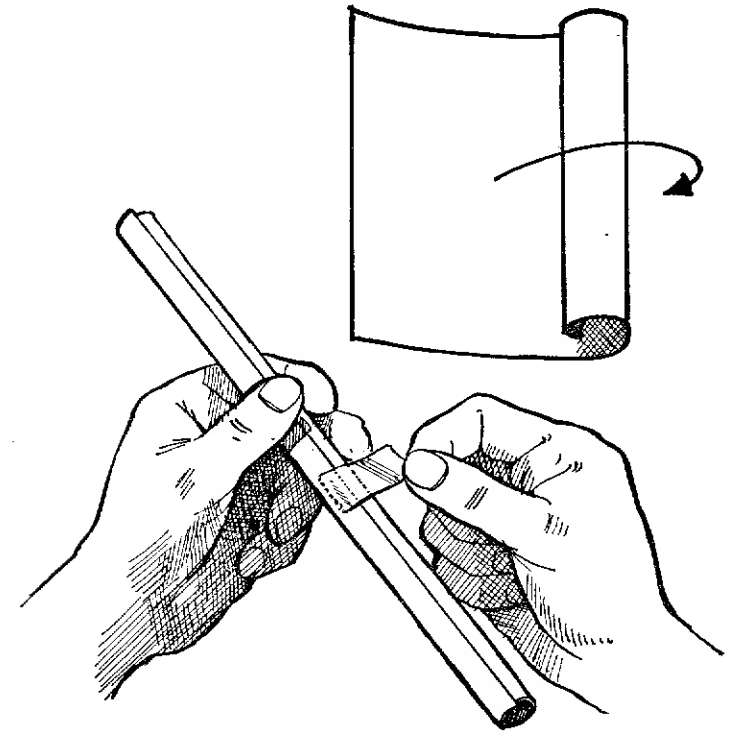
# BLOWING TOYS



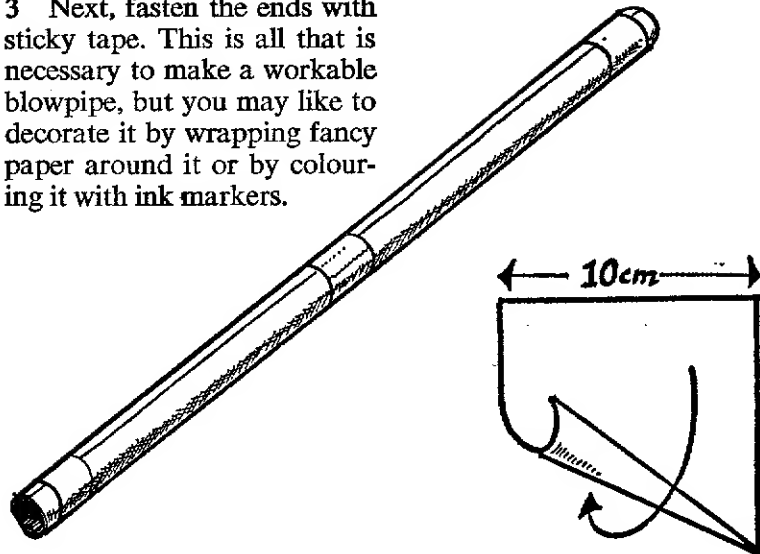
## Blowpipe and darts

You will need: *two sheets of paper*  
*pencil and ruler*  
*scissors or craft knife*  
*sticky tape*

- 1 To make the pipe: roll one sheet of paper lengthways to form a tube. It should measure not more than 2 cm across the end.
- 2 Make sure that the ends of the tube are level; then fasten the centre with a piece of sticky tape.

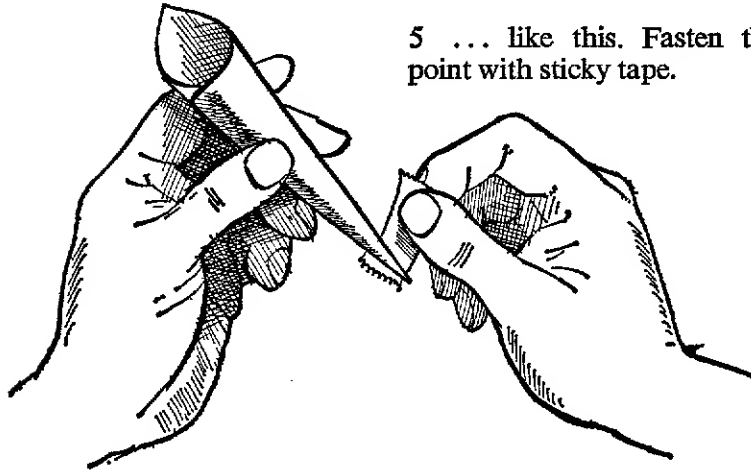


3 Next, fasten the ends with sticky tape. This is all that is necessary to make a workable blowpipe, but you may like to decorate it by wrapping fancy paper around it or by colouring it with ink markers.

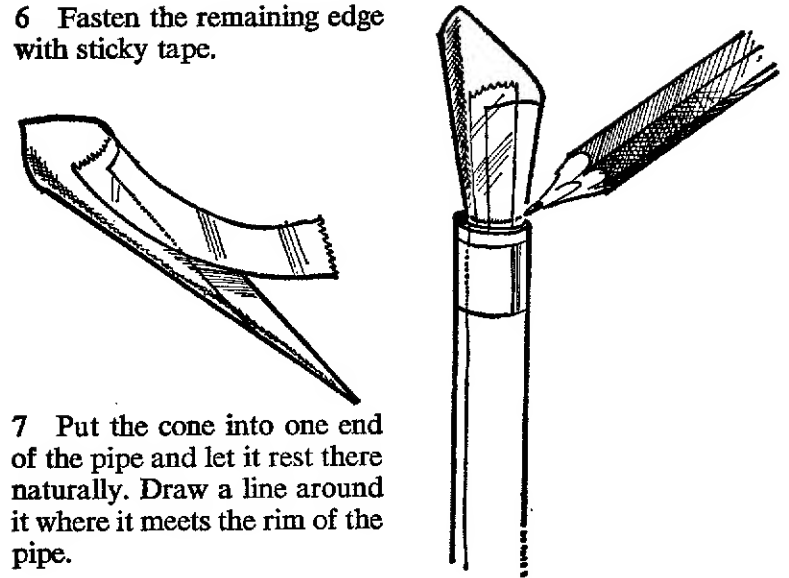


4 To make a dart: cut a 10-cm square of paper and roll it into a cone shape ...

5 ... like this. Fasten the point with sticky tape.

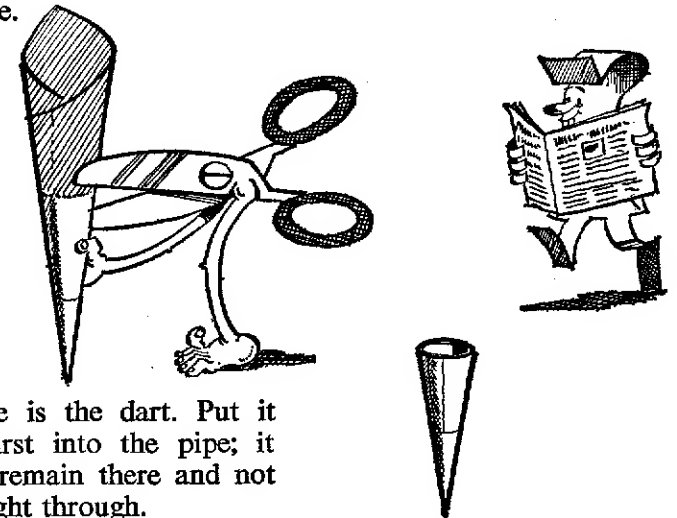


6 Fasten the remaining edge with sticky tape.



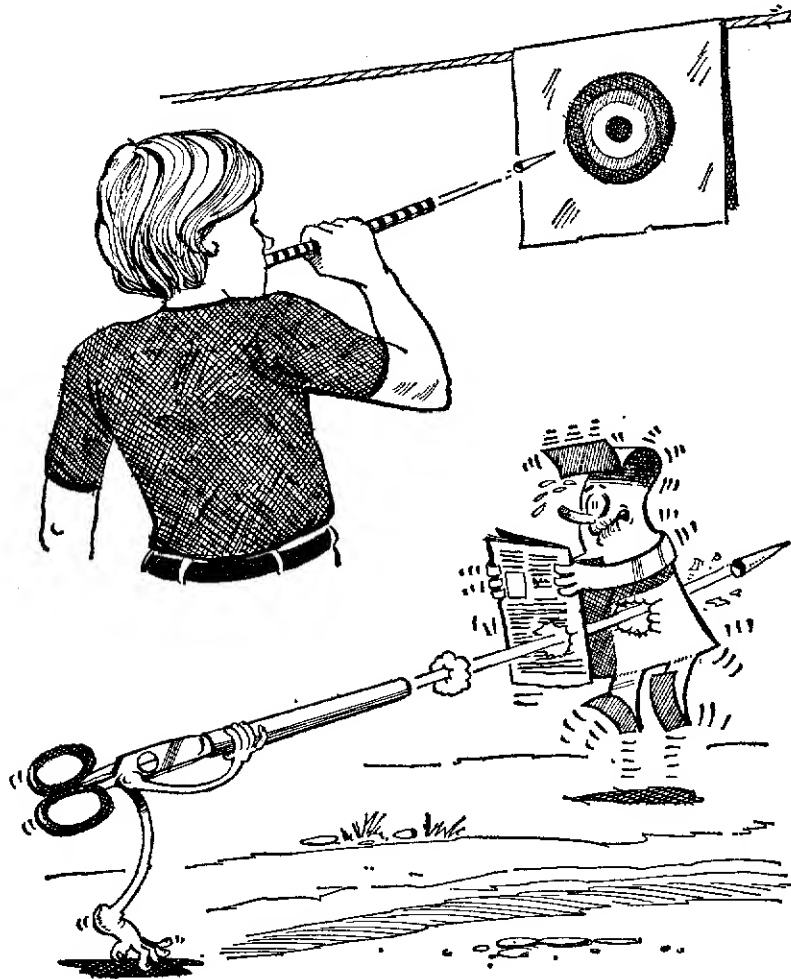
7 Put the cone into one end of the pipe and let it rest there naturally. Draw a line around it where it meets the rim of the pipe.

8 Remove the cone from the pipe and cut along the pencil line. The cone will flatten but it will take its shape again. Discard the top piece.



9 Here is the dart. Put it point first into the pipe; it should remain there and not drop right through.

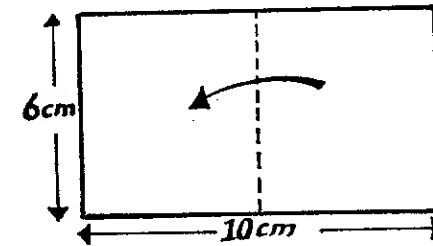
10 Blow through the end into which you have just inserted the dart. The dart travels with surprising force, so please do not aim it at people. A good target is a sheet of newspaper hung over a clothes line. Stand two or three metres from it and take aim. The dart will rip into the newspaper with a satisfyingly loud noise.



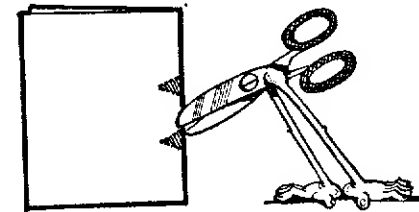
## Screecher

You will need: *one piece of paper (about 6 × 10 cm)*  
*scissors or craft knife*

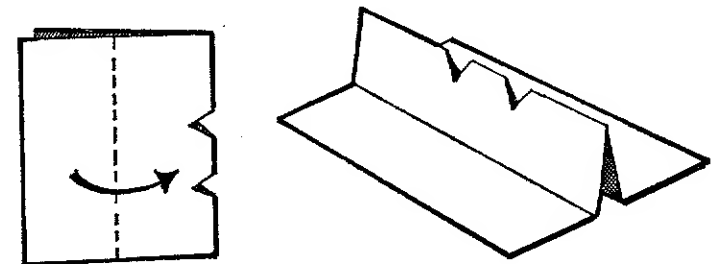
- 1 Fold the shorter edges of the paper together and crease.



- 2 Cut two tiny V-shaped pieces from the folded edge.



- 3 Fold the left edge to the right. Do the same behind.
- 4 Now let the two side pieces stand out from the middle section.





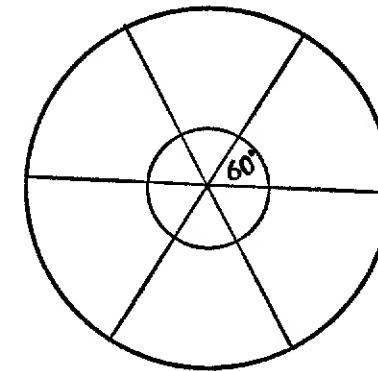
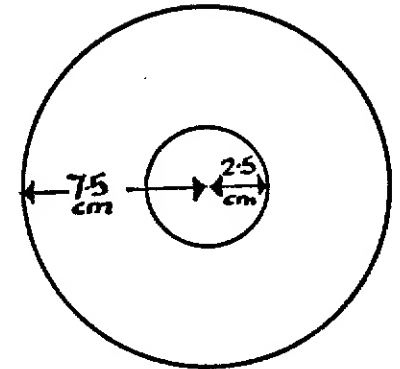
5 Hold the instrument vertically between the first and second fingers as shown and bring it to your lips. Blow and it will produce a piercing screech.



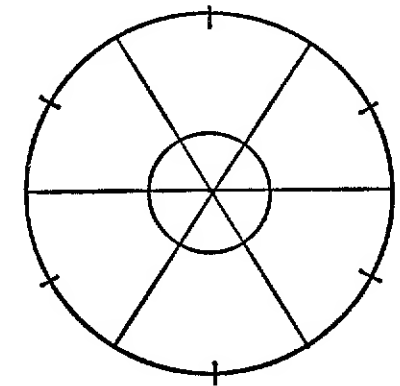
## Dancing lady

You will need: *one sheet of paper*  
*pencil and ruler*  
*scissors or craft knife*  
*glue or sticky tape*  
*pair of compasses*  
*60° set square*

1 To make the skirt: draw two concentric circles of 2.5 cm and 7.5 cm radius. Draw a horizontal line through the centre of the circles.

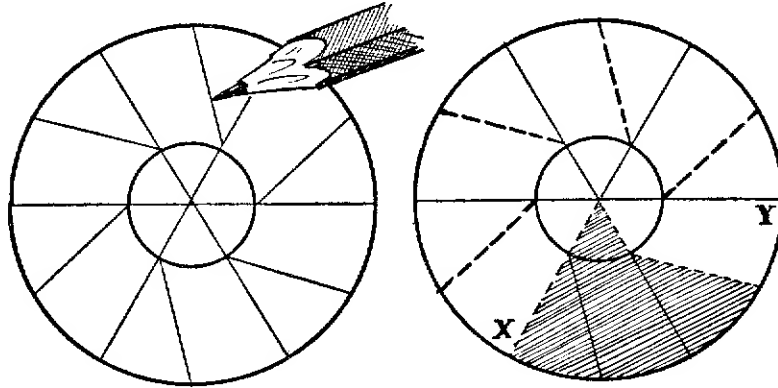


2 Draw 60° angles above and below the line from the centre. This will divide each of the circles into six segments.



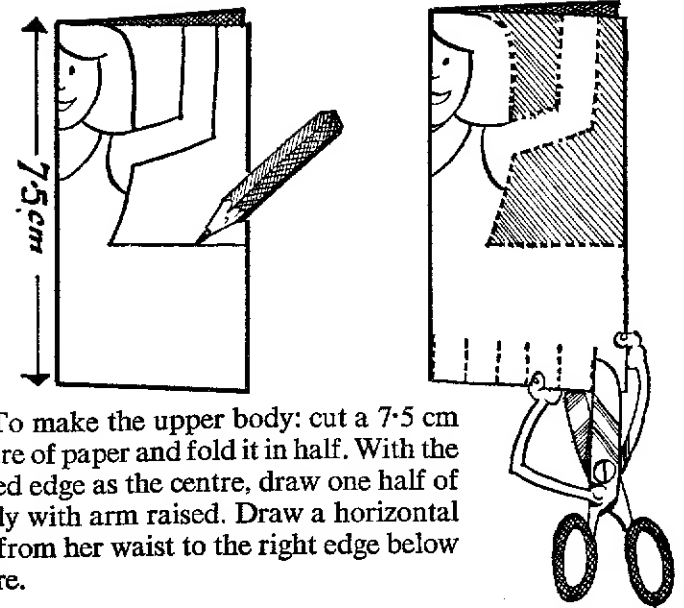
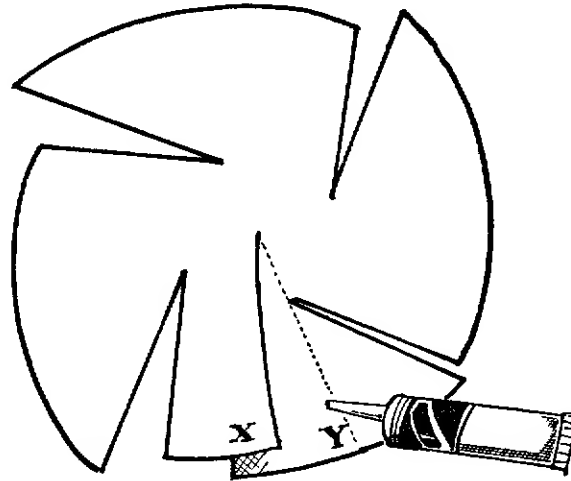
3 Mark the circumference of the outer circle at points half-way between each radial line.

4 Now draw a line from one of these points to the point where a nearby radial line cuts the inner circle. Draw five more similar lines, all slanting in the same direction.



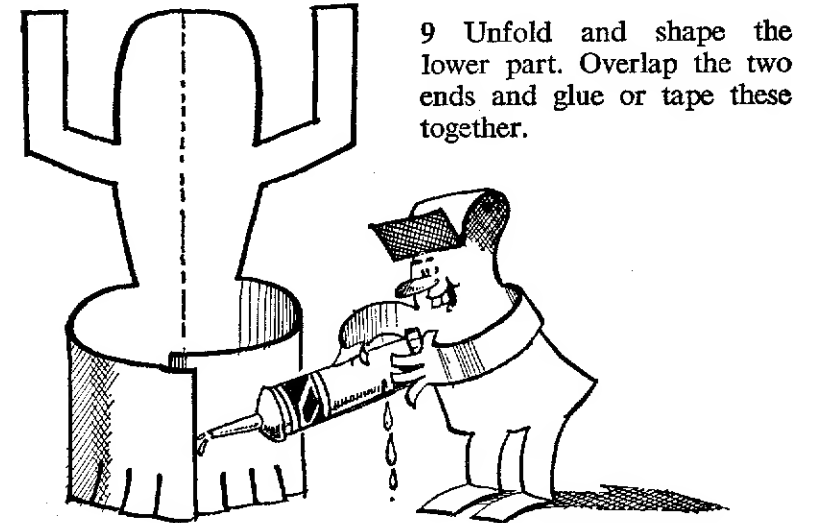
5 Cut along five of these lines. Make further cuts as shown and discard the shaded area.

6 Form a cone shape by bringing point X to meet point Y. Glue or tape in place. This completes the skirt.



7 To make the upper body: cut a 7.5 cm square of paper and fold it in half. With the folded edge as the centre, draw one half of a lady with arm raised. Draw a horizontal line from her waist to the right edge below centre.

8 Cut through both layers along this line and around the drawing. Discard the shaded area. Cut slits along the base.



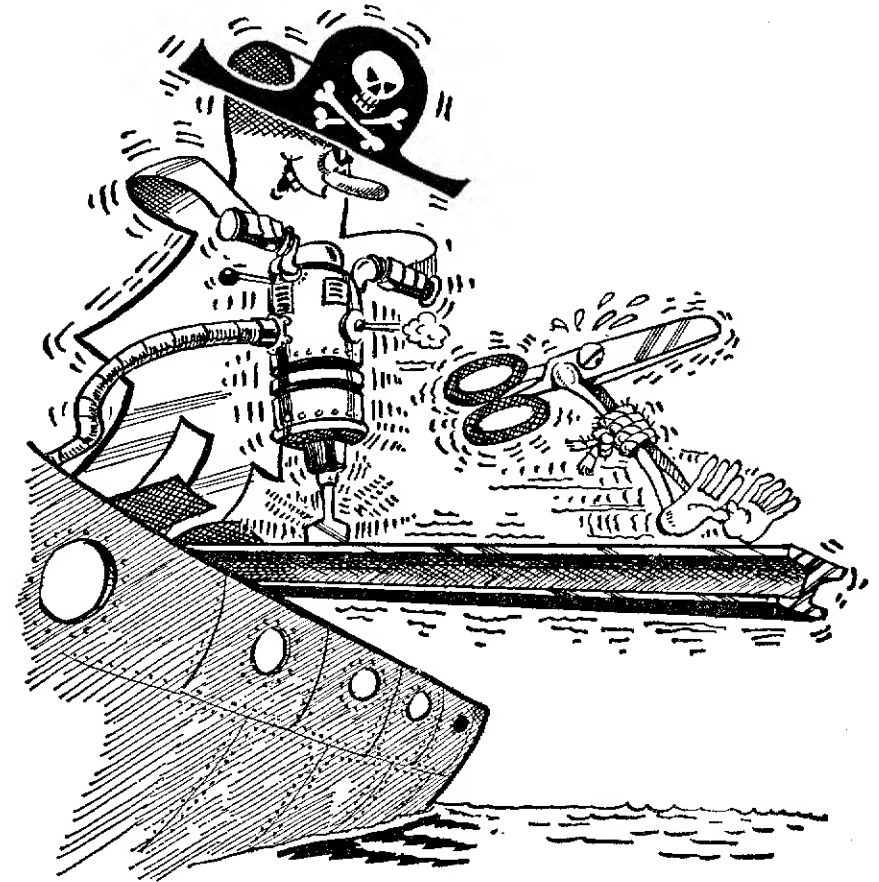
9 Unfold and shape the lower part. Overlap the two ends and glue or tape these together.

10 Raise the little tabs and glue them on the under side. Then fix the upper body to the skirt. Rearrange the arms a bit.

11 Balance your lady on the tip of a pencil. Blow her skirt and she will spin around.



## TOYS AND STUNTS THAT WORK BY VIBRATION OR FRICTION

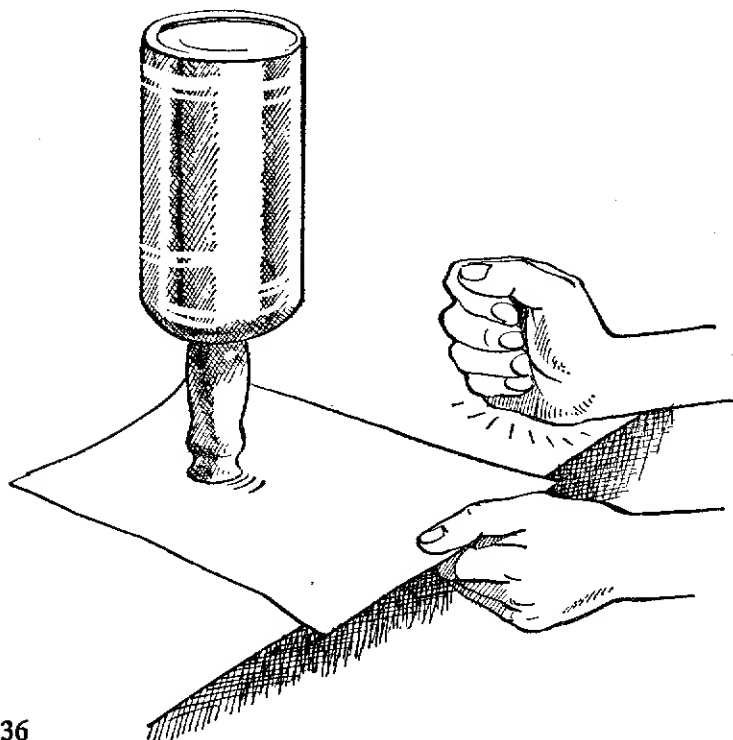


## Bottle and paper challenge

You will need: *one sheet of paper*  
*one empty bottle*

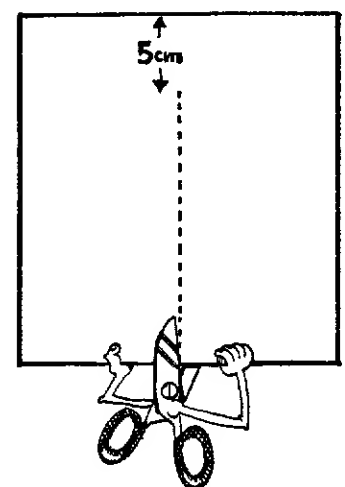
Place the sheet of paper on a table, then turn an empty bottle upside down and stand this on top of it. Challenge your friends to remove the paper without touching the bottle or knocking it over.

It can be done in this way – take hold of the paper with one hand and strike the table rapidly and repeatedly with the heel of your other hand. Pull the paper very gently as you do so. The bottle will jump sufficiently for you to move the paper gradually and finally to release it.



## Beetle race

You will need: *one sheet of paper*  
*one extra 4 cm square of coloured paper*  
*pencil and ruler*  
*scissors or craft knife*

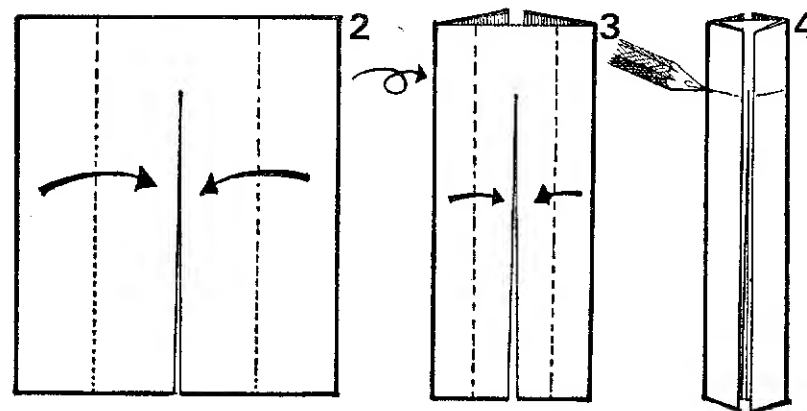


1 To make a track for the beetle: fold the two longer edges of the sheet of paper together, crease and open up. Cut this crease line up to about 5 cm from the top.

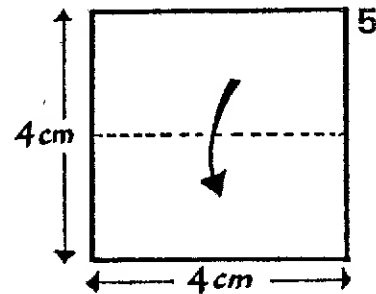
2 Fold the two sides to the centre line. Crease firmly and turn over.

3 Bring the two folded edges to the centre line and crease firmly.

4 Draw a horizontal line about 5 cm from the top (where the cut ends). This completes the track.

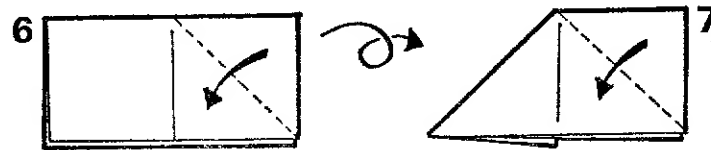


5 To make the beetle: fold opposite sides of the little square of coloured paper together in turn and leave folded in half.



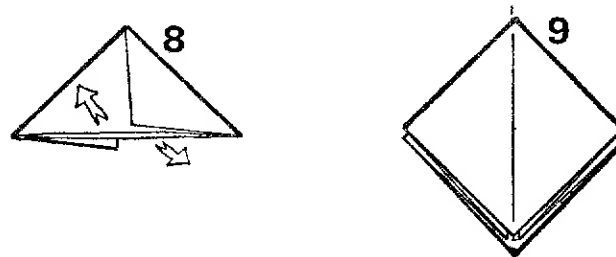
6 Make sure the folded edge is at the top; then fold the top right corner to centre bottom. Turn over.

7 Fold the top right corner to centre bottom.



8 Now pull the middle layers apart, opening out the centre. Allow the two sides to flatten out and the corners to come together in the centre.

9 This is the beetle completed.

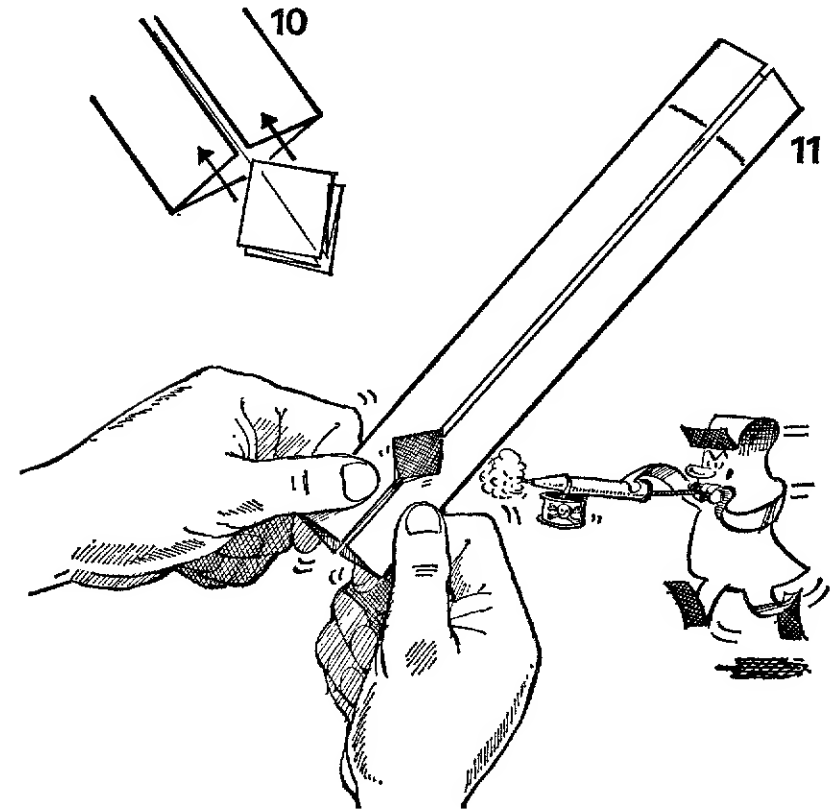


10 Slide the beetle onto the track; each triangular flap of the beetle should run either above or below one of the two top folded edges of the track.

11 To operate, hold the track as shown and agitate it slightly by moving each hand back and forth rapidly. You will find that the beetle will start to move upwards.

Shift the position of your hands when necessary, moving them up the track behind the beetle but not touching it. Continue to agitate your hands so that the beetle keeps advancing upwards.

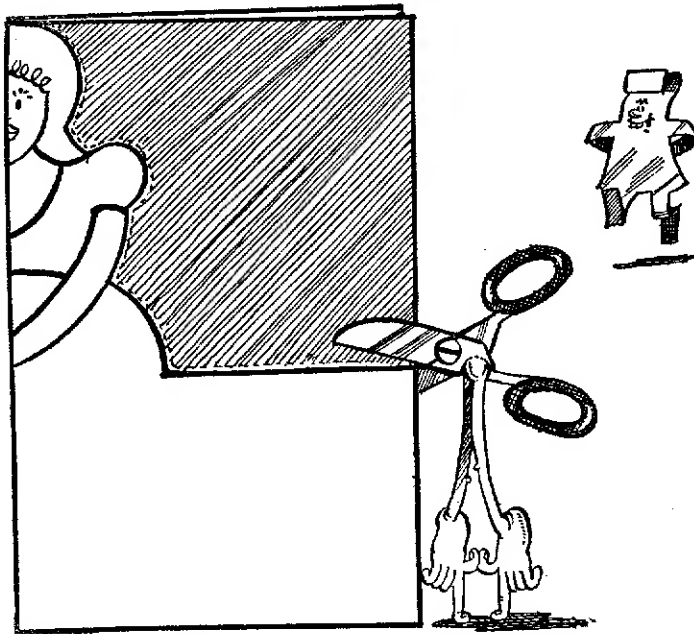
Get your friends to make a beetle and track too so that you can have beetle races.



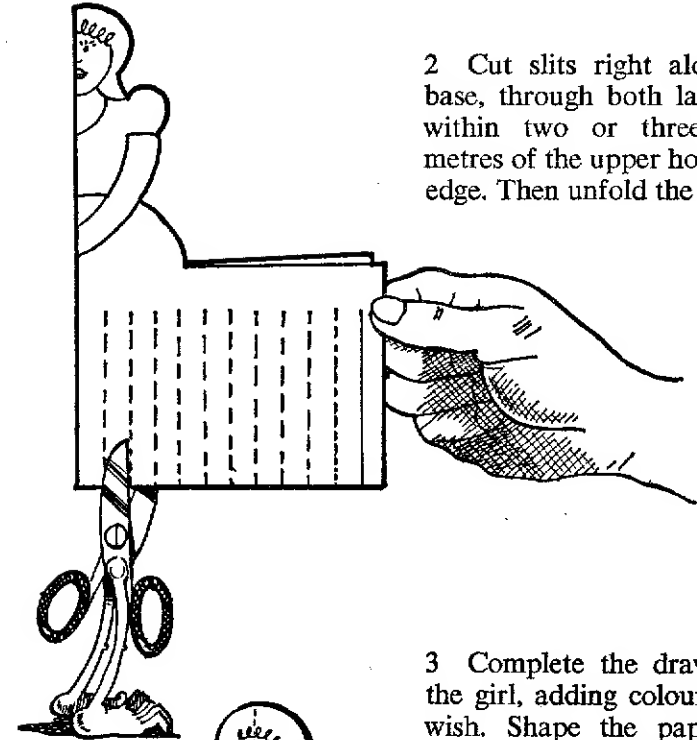
## Mary and her little lamb

You will need: *one sheet of paper*  
*pencil and ruler*  
*scissors or craft knife*  
*glue or sticky tape*

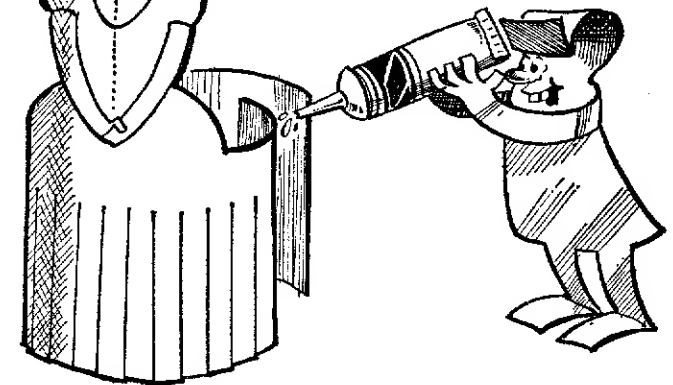
1 To make Mary: fold the two shorter edges of the paper together and crease firmly. Draw one half of a girl centred on the folded edge. Draw a horizontal line from the girl to the right edge, below centre. Cut along this line, through both layers, and around the outline of the drawing above it. Remove the shaded area carefully.



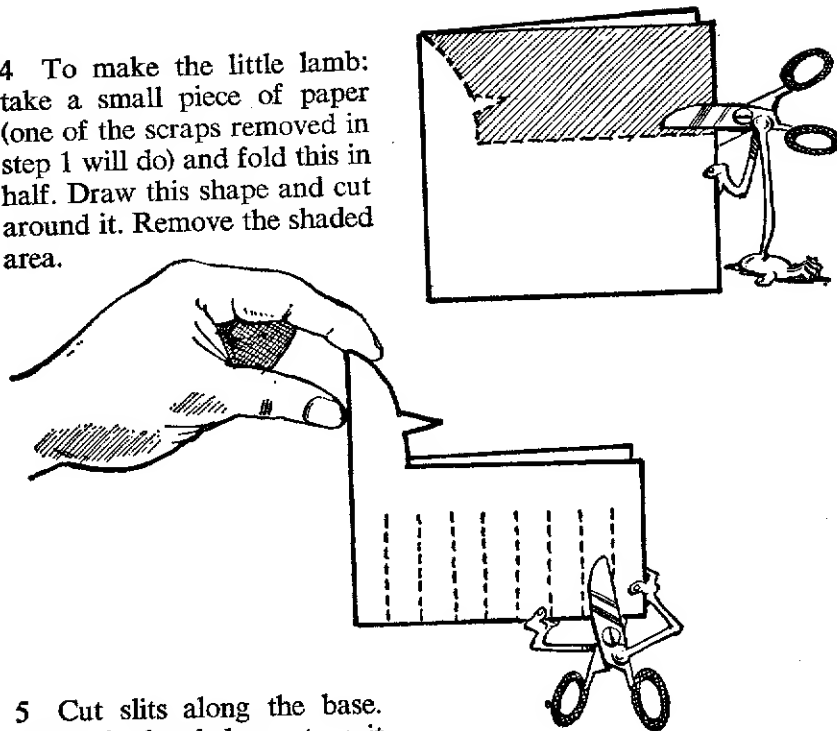
2 Cut slits right along the base, through both layers, to within two or three centimetres of the upper horizontal edge. Then unfold the paper.



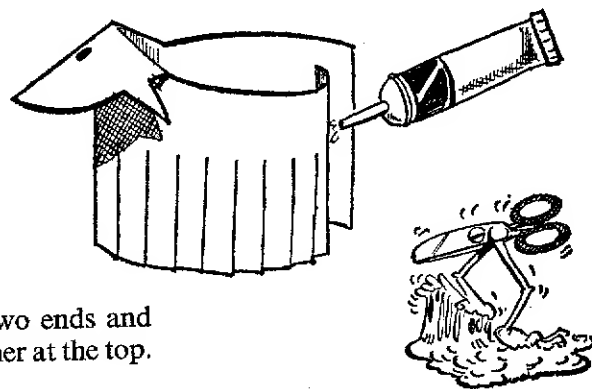
3 Complete the drawing of the girl, adding colour if you wish. Shape the paper and overlap both ends. Glue or tape these together at the top.



4 To make the little lamb: take a small piece of paper (one of the scraps removed in step 1 will do) and fold this in half. Draw this shape and cut around it. Remove the shaded area.



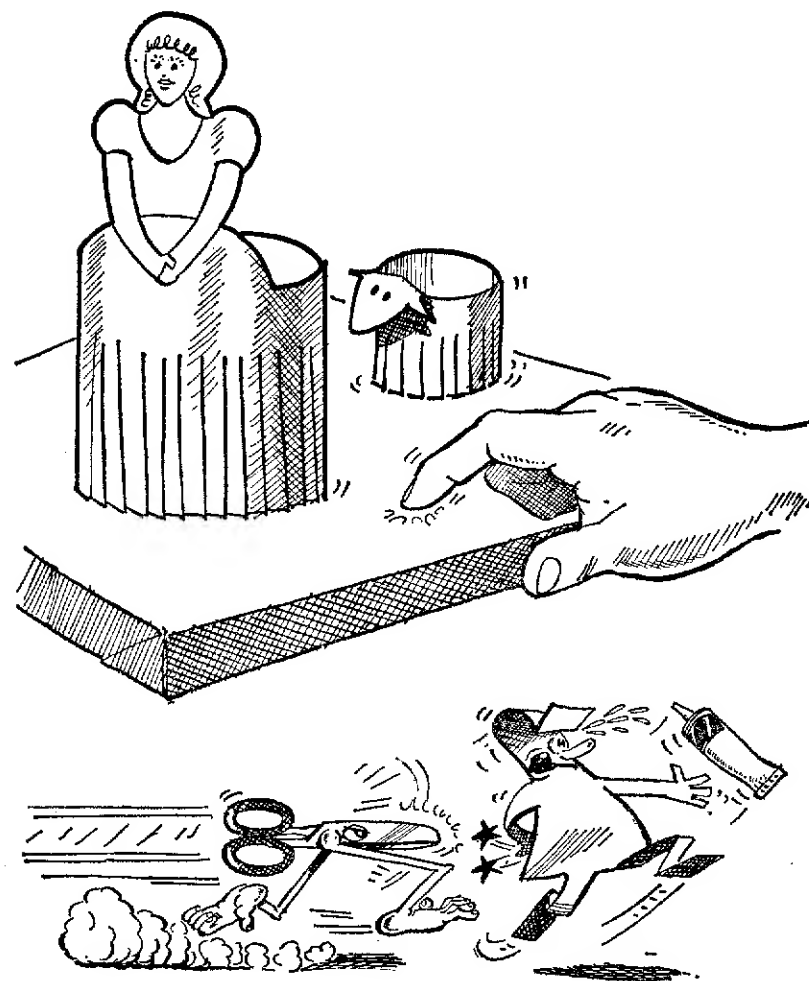
5 Cut slits along the base. Bring the head down; turn it inside out and pinch it into position.



6 Overlap the two ends and glue or tape together at the top. Draw in the eyes.

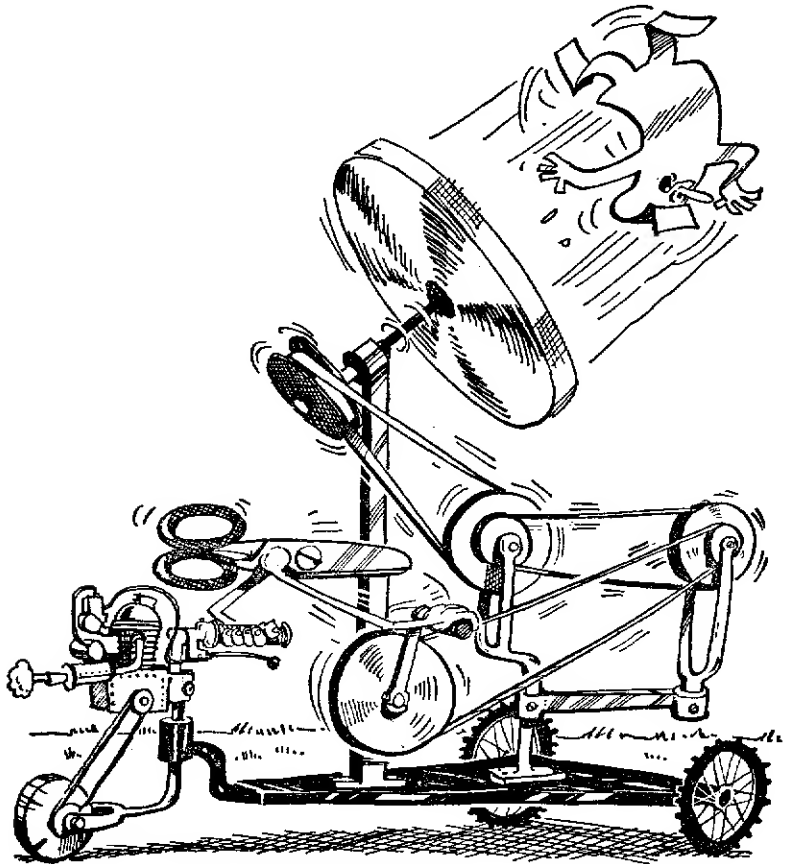
7 Place Mary and her lamb on top of an upturned cardboard box or tray. Tap gently and Mary will run forward with the little lamb following.

Other subjects can be treated in this way.





# TOYS AND STUNTS THAT WORK BY DISTURBANCE OF AIR

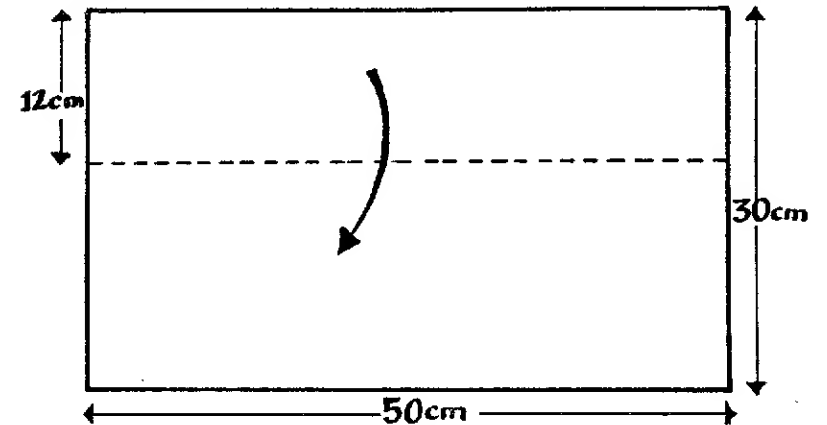


## Folding fan

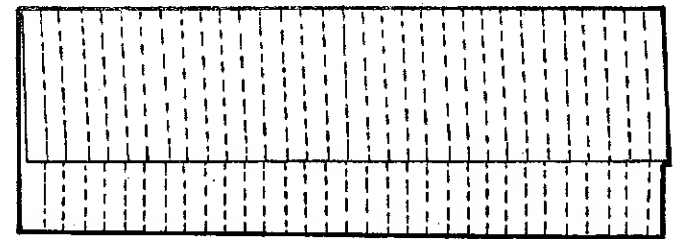
You will need: *one sheet of paper (at least 30 × 50 cm)*  
*pencil and ruler*  
*sticky tape*

The centre pages from a magazine will serve as the sheet of paper, but fancy wrapping paper would be better still.

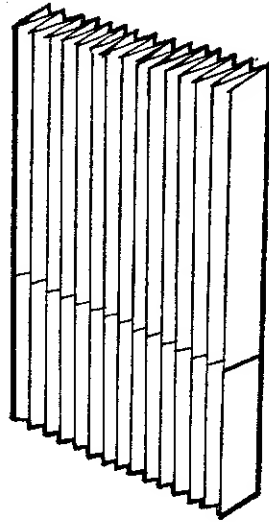
- 1 Fold the top down on a line about 12 cm from the top edge.



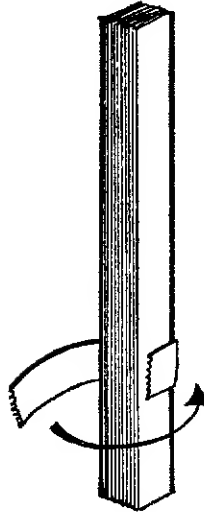
- 2 Now pleat the length of the paper into 32 sections. This can be done by first folding the paper into halves, then into quarters, into eighths, into sixteenths and finally into 32 sections, then unfolding and pleating along these creases.



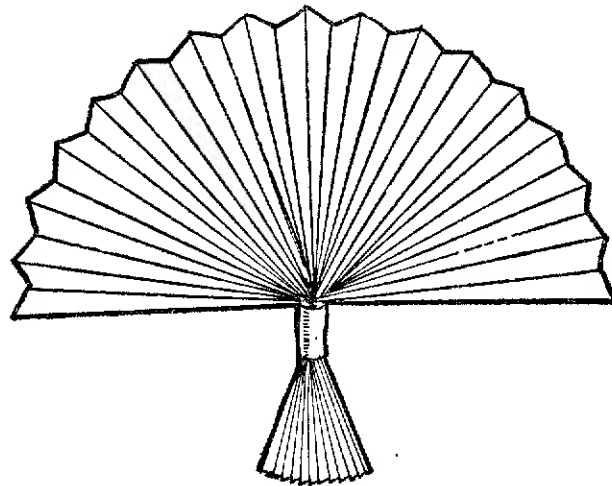
3 This is the result.



4 Form the handle by wrapping sticky tape around here.



5 Open out to make the fan.

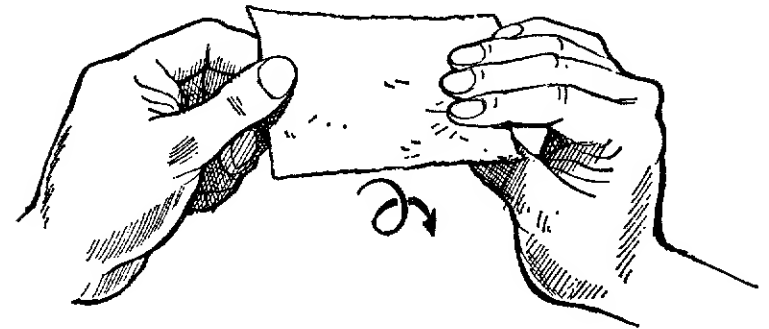


## Japanese butterflies

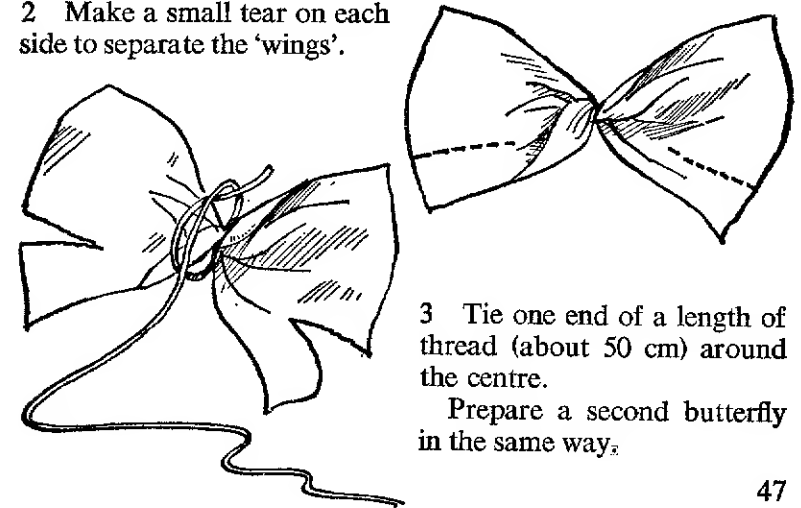
You will need: *one piece of coloured tissue paper*  
*thread*  
*folding fan (as shown on page 45)*

These paper butterflies seem to come alive and dance about when they are thrown into the air.

1 Cut out a rectangle of tissue paper, about  $7 \times 10$  cm. Twist it two or three times in the centre.



2 Make a small tear on each side to separate the 'wings'.



3 Tie one end of a length of thread (about 50 cm) around the centre.

Prepare a second butterfly in the same way.

4 Take the butterflies in one hand and place the free ends of the threads into your mouth (or tie them to a button on your shirt or blouse).

Pick up the fan and release the butterflies. As you do so, stir up the air beneath them by fanning vigorously. The butterflies will flutter about as if they were alive.

With experience you will discover how to vary the strokes of your fan. Sometimes long forward strokes are needed to prevent the butterflies coming too close and settling on your head or shoulders.

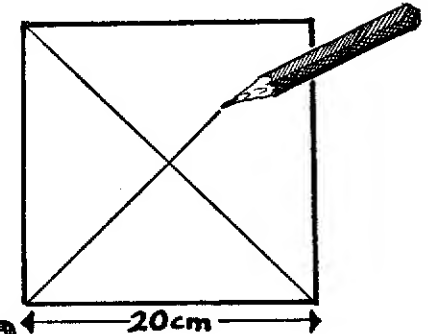
Many years ago, Japanese conjurers used to perform this trick, making the butterflies dance to music and not letting their audiences suspect that they were joined by threads. Even if you cannot carry the deception as far as that, it can still be fun.



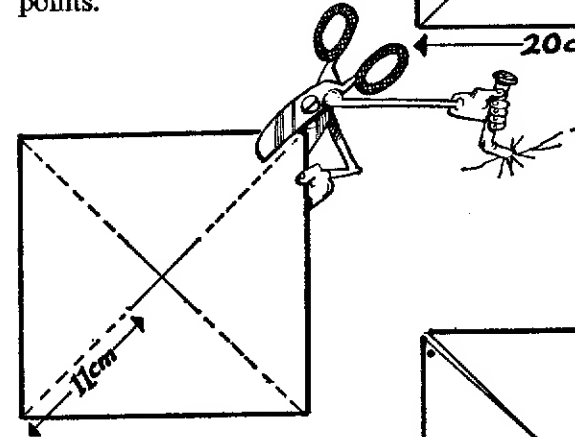
## Pinwheel

You will need: *one sheet of paper (a magazine cover will do)*  
*pencil and ruler*  
*scissors or craft knife*  
*glue*  
*flat-headed nail (about 7.5 cm long)*  
*wooden stick*

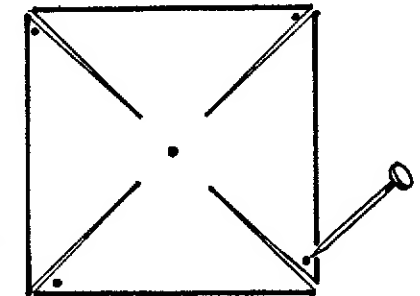
1 Cut a 20 cm square from the paper. Draw the two diagonal lines.

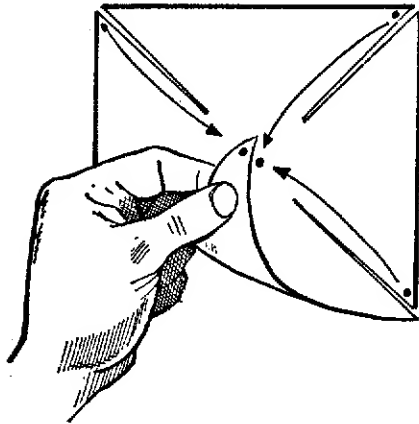


2 Measure 11 cm in from each corner and mark. Then cut along the diagonals to these points.



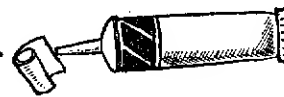
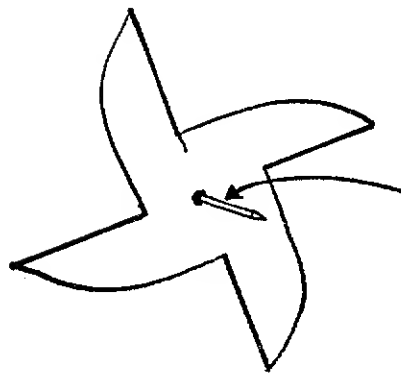
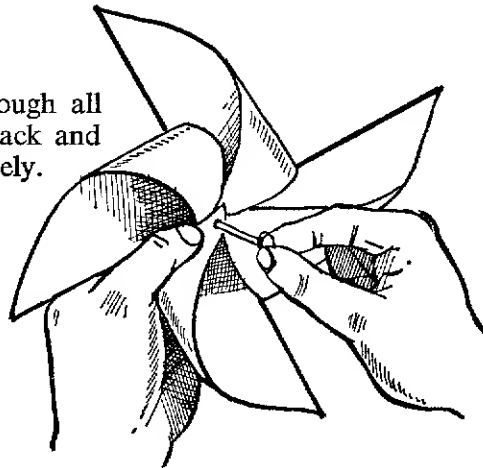
3 With the nail, make a neat hole in the centre and another on each triangular flap as shown.





4 Curl one flap over so that its hole is in line with the centre. Curl the three remaining flaps over in the same way.

5 Push the nail through all the holes. Work it back and forth so that it fits loosely.



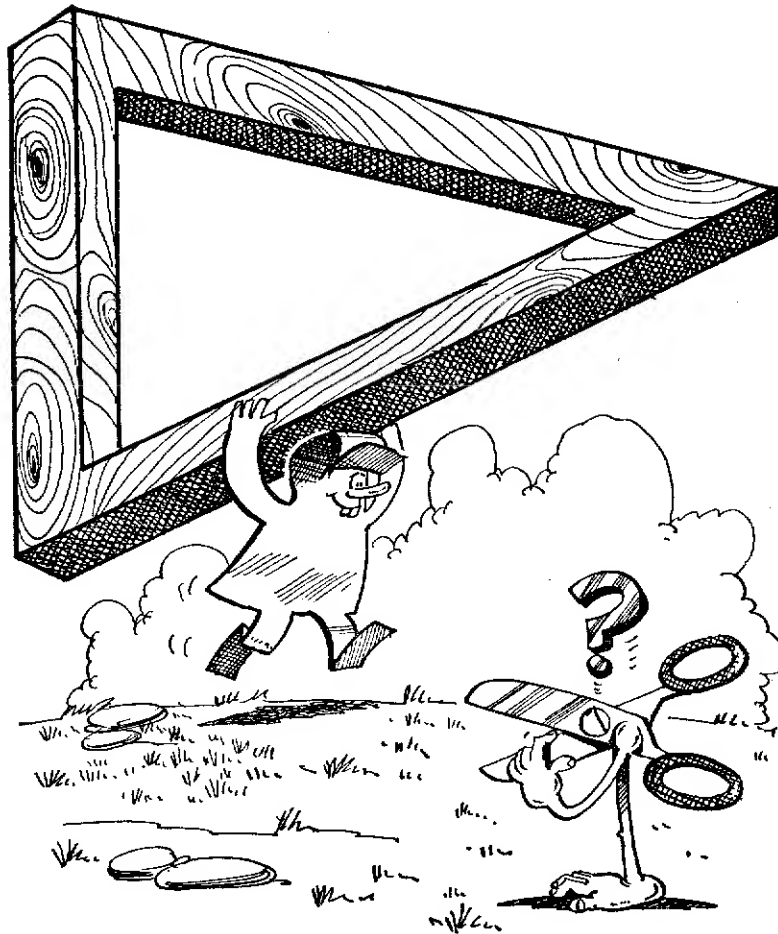
6 Cut a small strip of paper not more than 1 cm wide. Roll it up and glue the end. Place this on the nail behind the pinwheel to serve as a washer.



7 Finally, push the nail into a wooden stick. Flourish in the air and the wheel will spin around.



# OPTICAL ILLUSIONS

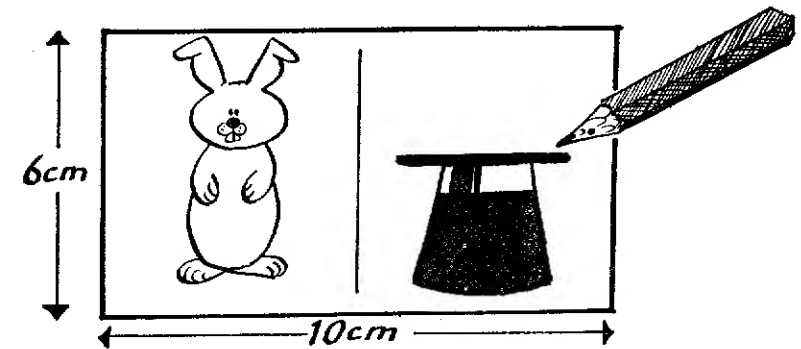


## Rabbit in a hat

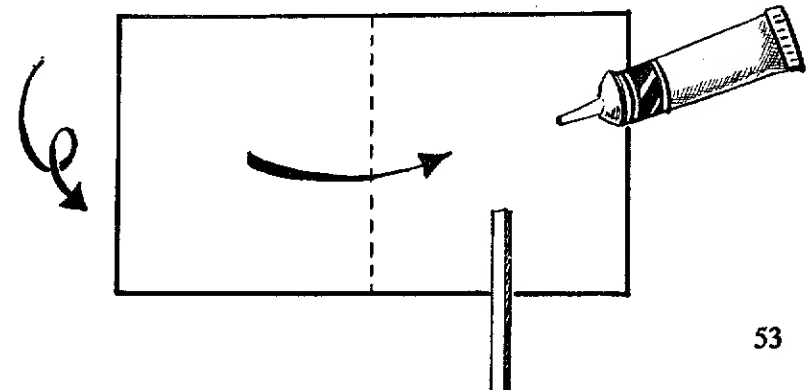
You will need: *one piece of paper (6 × 10 cm)*  
*pencil*  
*glue*  
*used matchstick*

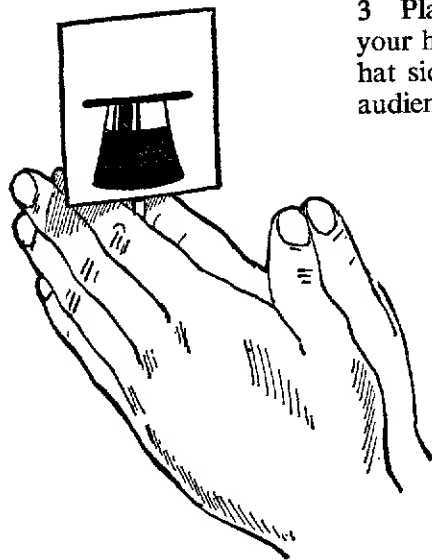
1 To make the centre line, fold the two shorter edges of the paper together, crease and open up.

Draw a rabbit on the left and an upturned top hat on the right. Turn the paper over, keeping it the same way up.

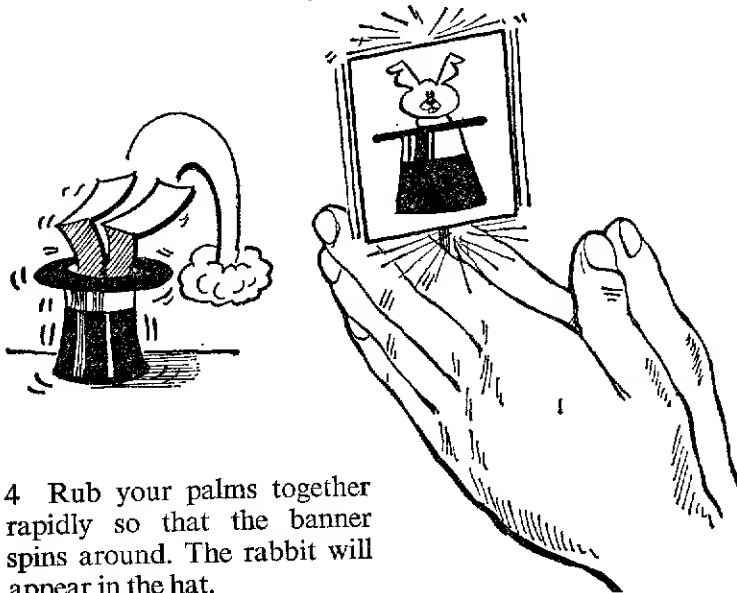


2 Place the matchstick as shown and glue in place. Fold the left edge of the paper to the right and glue the two layers together. This makes a little banner with the rabbit on one side and the hat on the other.





3 Place the banner between your hands as shown with the hat side towards you or your audience.

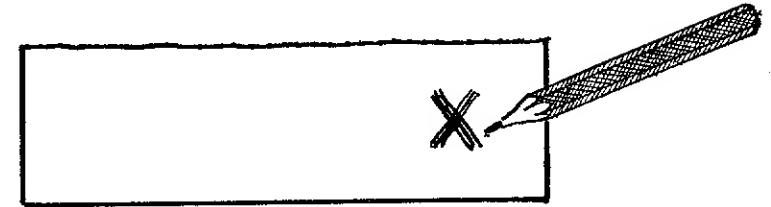


4 Rub your palms together rapidly so that the banner spins around. The rabbit will appear in the hat.

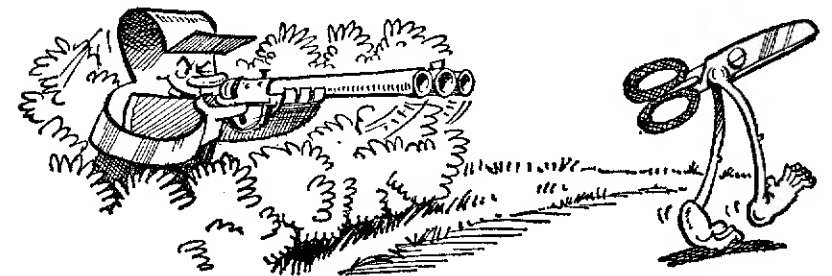
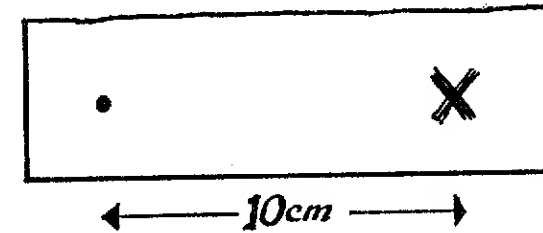
## Disappearing dot

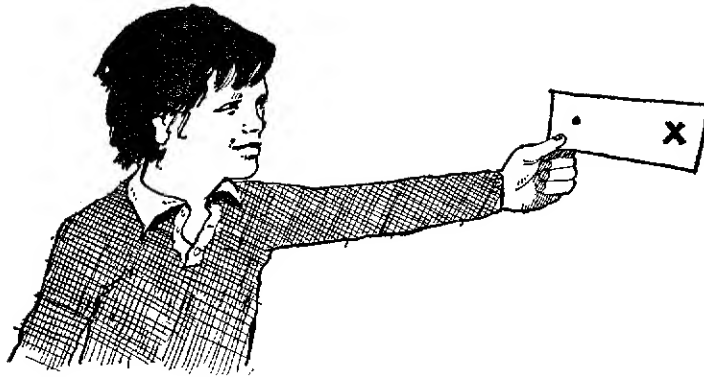
You will need: *one scrap of paper*  
*ink marker or crayon*  
*ruler*

1 Draw an X on the right side of a scrap of paper.

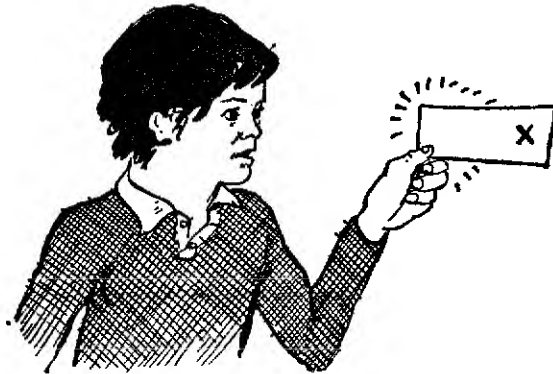


2 Draw a dot 10 cm to the left of the X.





3 Hold the paper at arm's length in front of you and look hard at the X; you will now be able to see the dot out of the corner of your eye.



4 Keep concentrating on the X and slowly bring the paper closer to your eyes. Suddenly the dot will disappear completely from view.



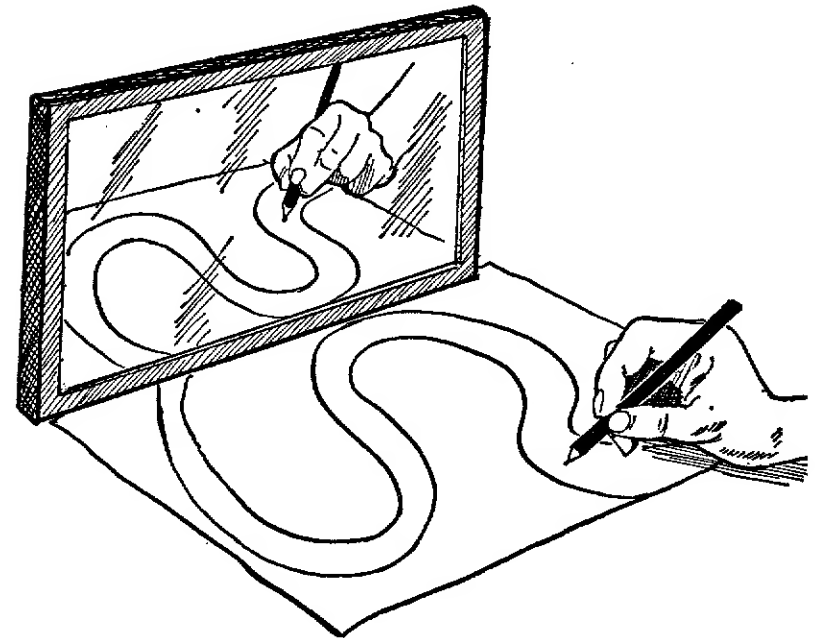
## Road racing

You will need: *one large sheet of paper*  
*mirror*  
*pencil, ink marker or crayon*

To represent a road, draw a big S-shaped curve on your sheet of paper. Place this on a table, or any other flat surface, in front of a mirror.

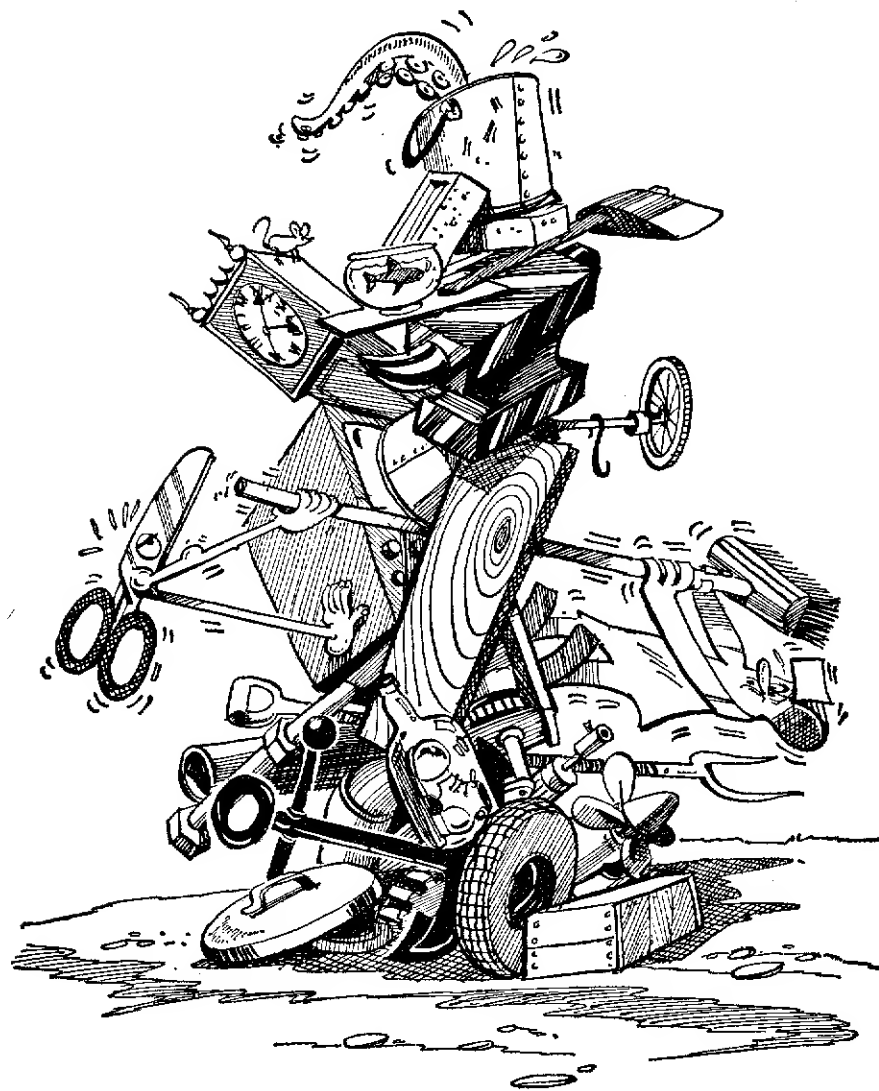
Point your pencil at the start of the road and look at its reflection in the mirror. With your eye on the reflection only, see if you can trace a line around the track without moving the pencil over the edge.

To make it more interesting, you can draw a track with extra twists and turns in it – and surround it with hazards too, such as buildings, swamps, cliffs and lakes.





# ODDS AND ENDS



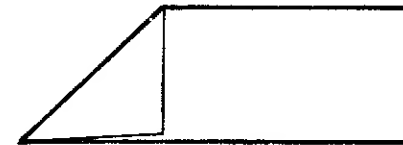
## Self-opening envelope

You will need: *letter*  
*envelope*  
*scissors or craft knife*

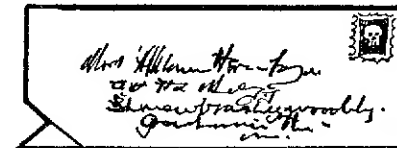
You may like to get your friends to use this simple stunt when sending letters to you.

First write a letter and address an envelope in the usual way. Then fold the letter to fit the envelope.

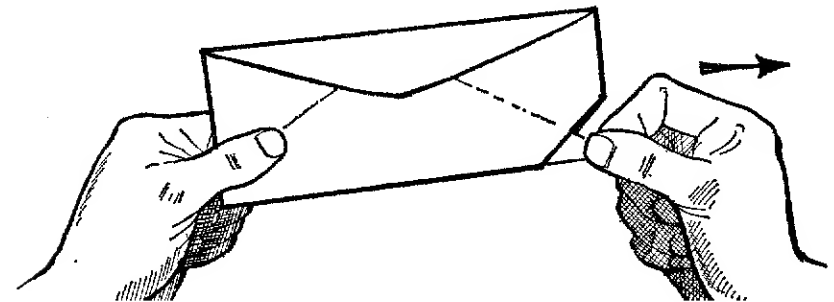
- 1 Fold the letter so that one end lies along the bottom edge.



- 2 Cut off one corner of the envelope. Place the folded letter inside with the pointed end sticking through the hole in the envelope. Seal and post.



- 3 To open, just take hold of the point and pull sharply. The letter will slice through the envelope like a knife.

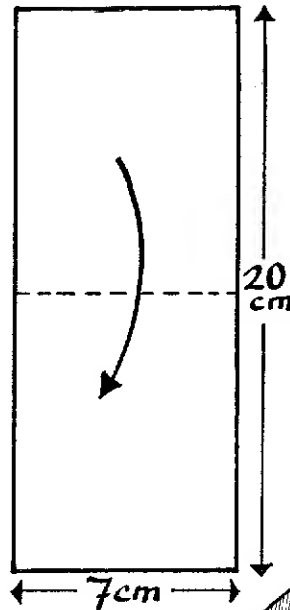


## Camera

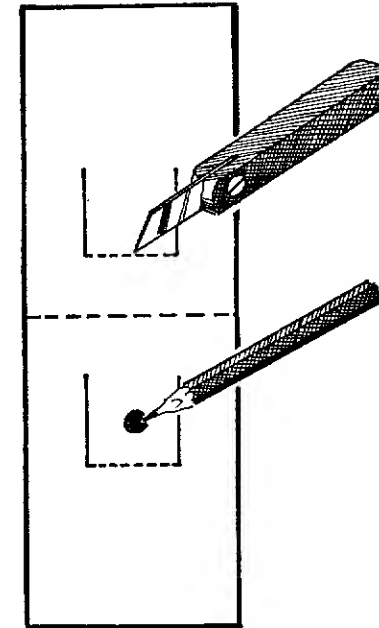
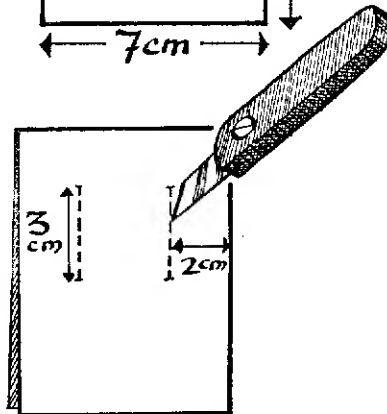
You will need: *one sheet of paper*  
*pencil and ruler*  
*scissors or craft knife*

This little toy does not look much like a camera but it sounds like one.

1 Cut out a rectangle of paper about  $7 \times 20$  cm. Fold the two shorter edges together.



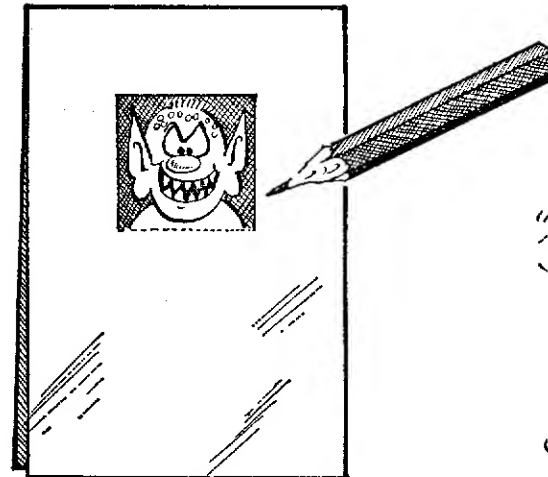
2 Measure 2 cm from the folded top edge and 2 cm from the sides and draw two vertical 3 cm lines down from these points. Cut along these lines through both layers of paper. Open up.



3 On the inside of the paper, cut a horizontal slit between the lower ends of each pair of vertical slits.

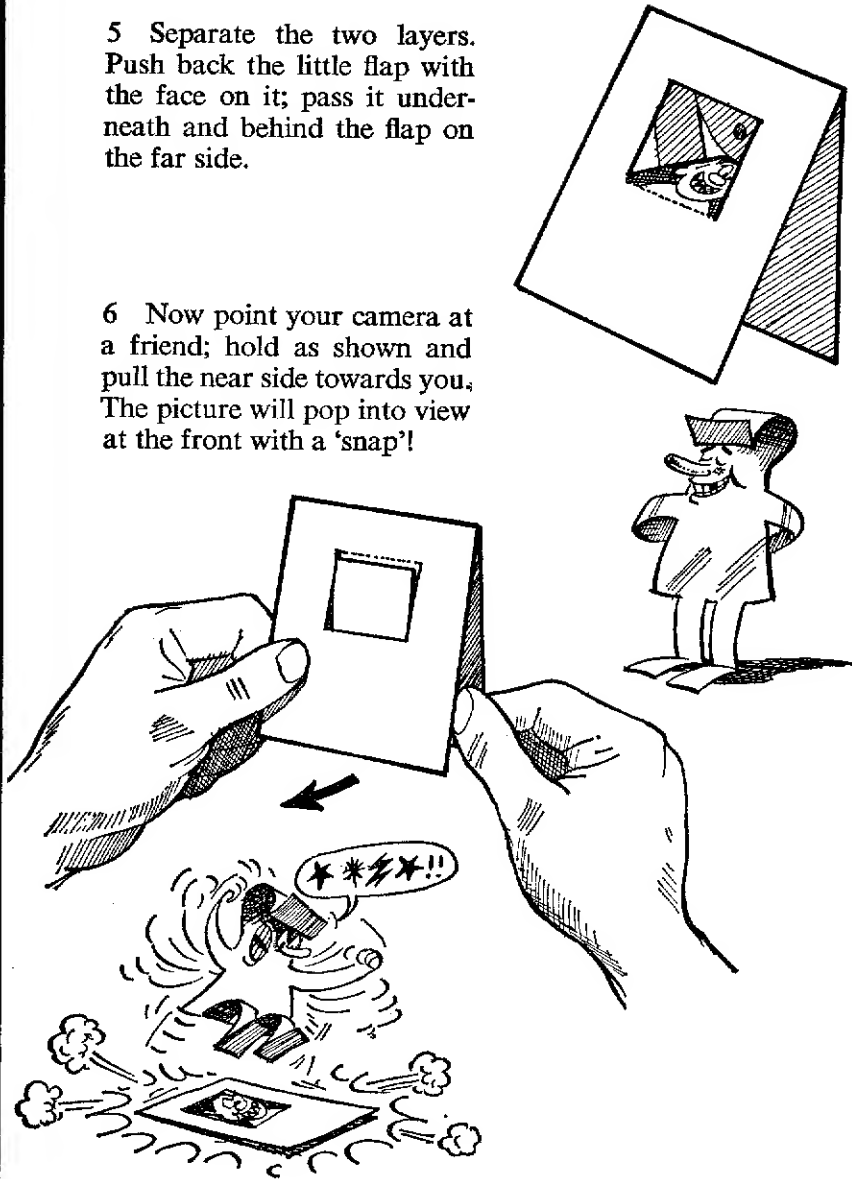
On the lower part, draw a circle to represent the camera lens. Then close the paper again as it was before.

4 Draw a funny face in the space framed by the cuts.



5 Separate the two layers. Push back the little flap with the face on it; pass it underneath and behind the flap on the far side.

6 Now point your camera at a friend; hold as shown and pull the near side towards you. The picture will pop into view at the front with a 'snap'!

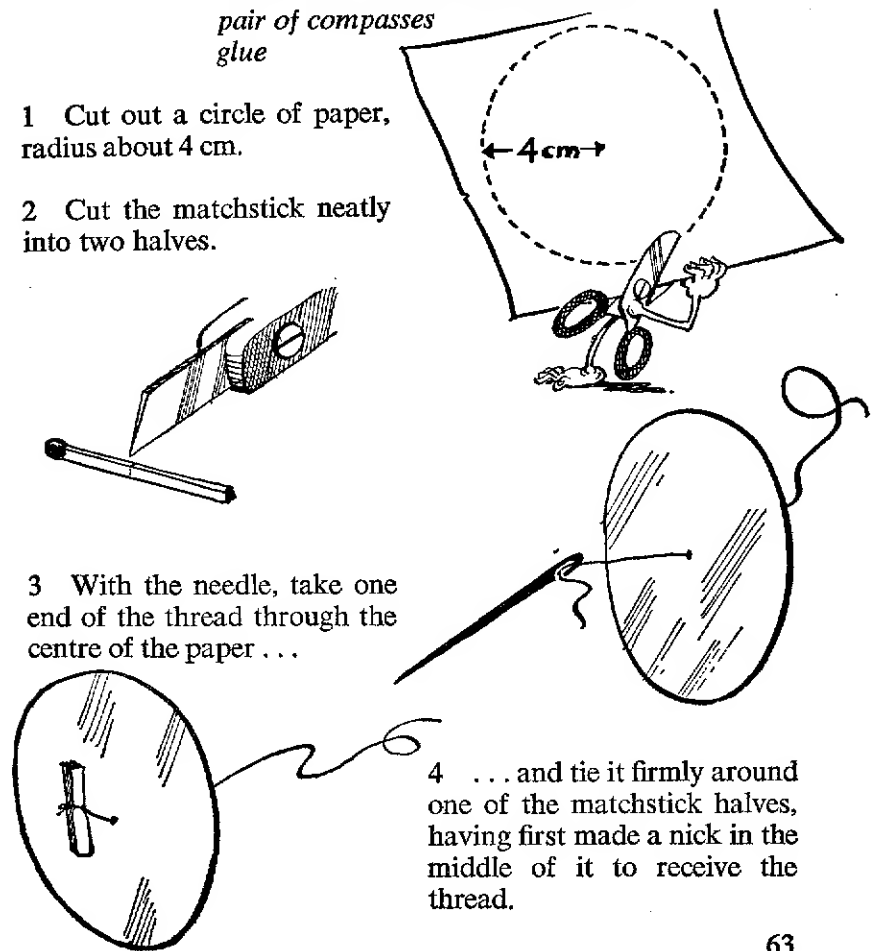


## Telephone

You will need: *one sheet of paper*  
*pencil and ruler*  
*scissors or craft knife*  
*two empty toilet rolls*  
*used matchstick*  
*needle and thread (3 metres or more)*  
*pair of compasses*  
*glue*

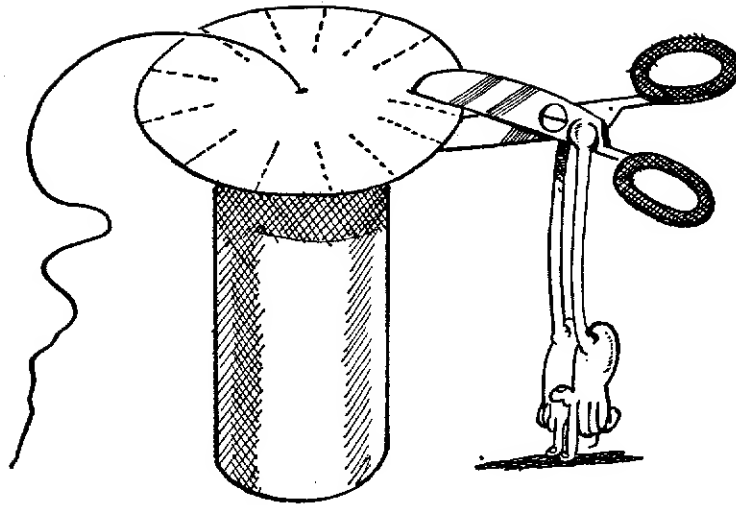
1 Cut out a circle of paper, radius about 4 cm.

2 Cut the matchstick neatly into two halves.



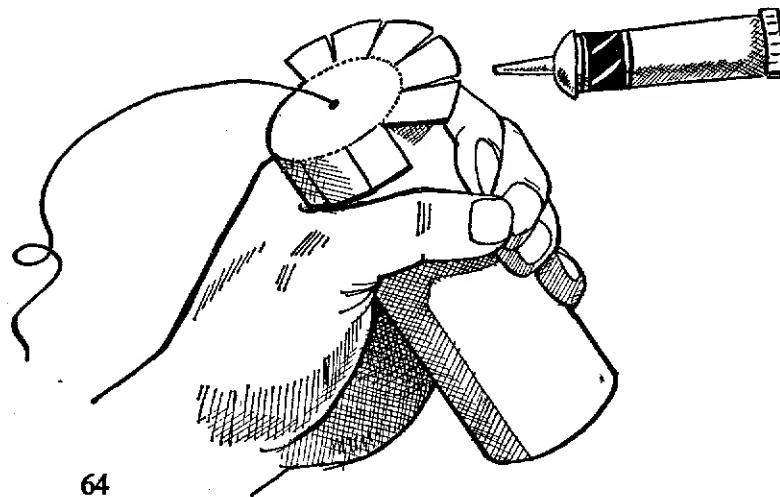
3 With the needle, take one end of the thread through the centre of the paper ...

4 ... and tie it firmly around one of the matchstick halves, having first made a nick in the middle of it to receive the thread.

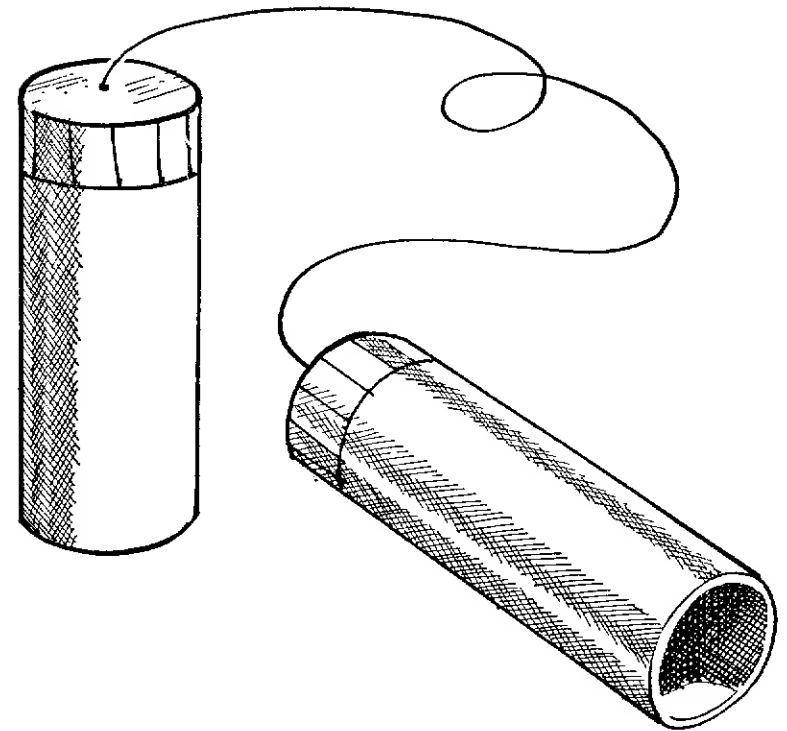


5 Place the paper circle, with the matchstick underneath, over the end of one of the empty toilet rolls. Make a circle of flaps around the paper by cutting from the edge of the paper to the edge of the toilet roll.

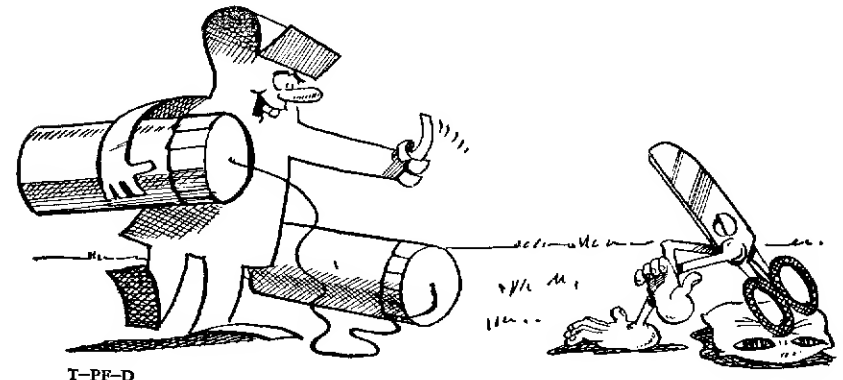
6 Fold the flaps down and glue them to the roll. This completes one 'handset'.



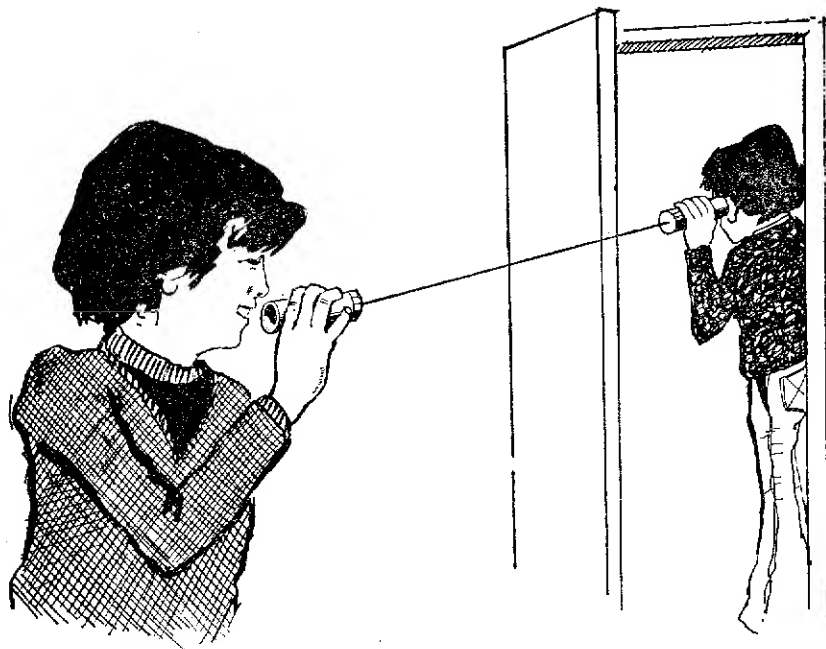
64



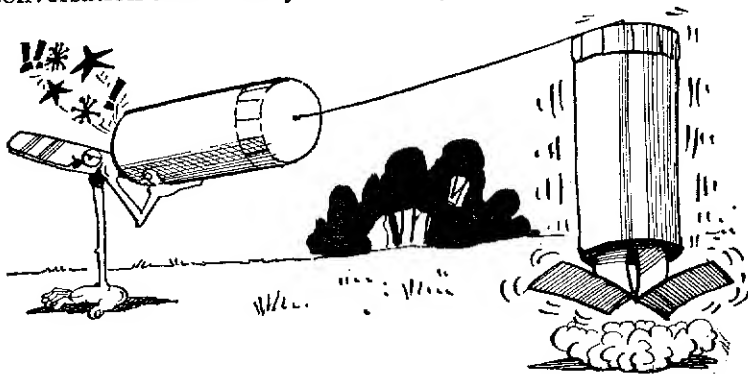
7 Repeat these steps at the other end of the thread to complete a second handset.



T-PF-D



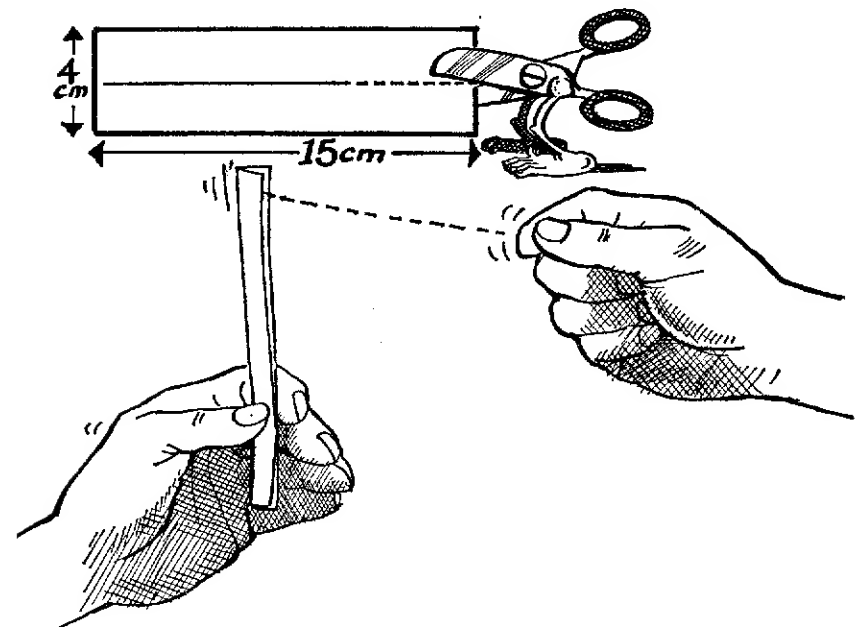
8 Somebody speaking into one end of the telephone can be heard by a second person listening at the other end. Provided you keep the thread taut, two of you will be able to carry on a conversation comfortably even when you are in separate rooms.



## Invisible thread

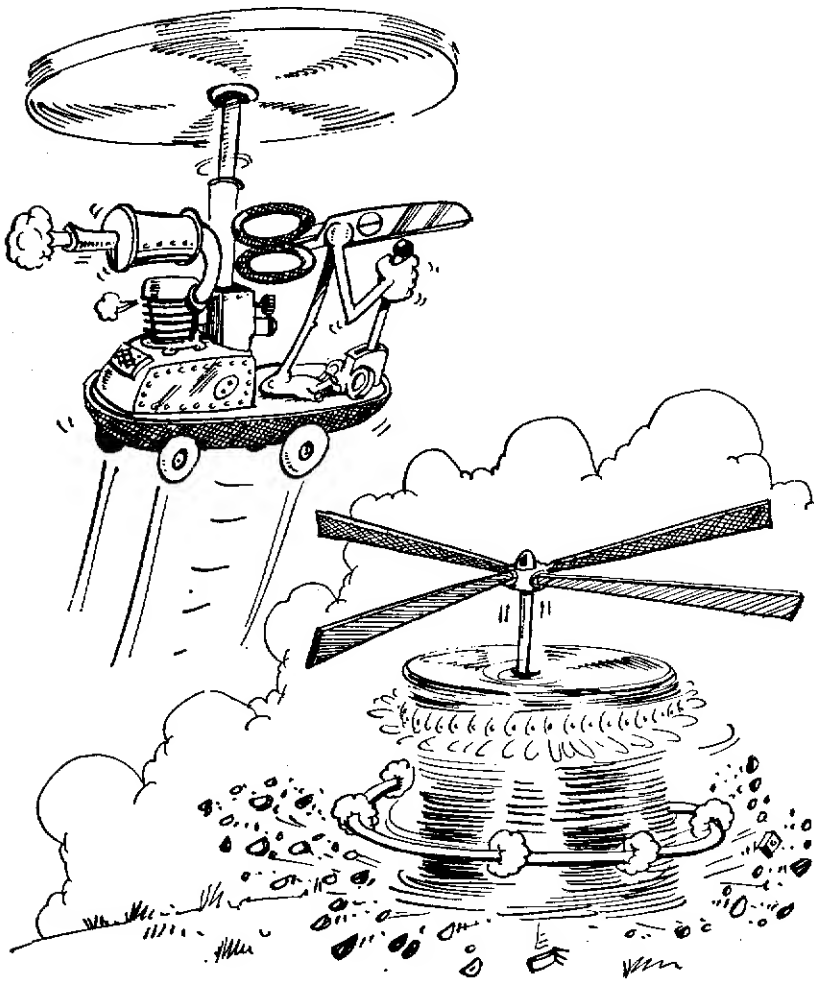
You will need: *one sheet of paper*  
*pencil and ruler*  
*scissors or craft knife*

1 Cut out a rectangle of paper about  $4 \times 15$  cm. Find the centre line by folding the two longer edges together; then open the paper again. Cut along the centre line to about 5 cm from one end and fold the paper in half once more.



2 You can amuse a younger brother or sister by pretending to tie a thread to the paper and then acting as if you were pulling it. (In fact, you hold the paper at the cut end and secretly move it with your thumb.) By matching the movements of your free hand with those of the paper, you can almost convince on-lookers that you are pulling an invisible thread.

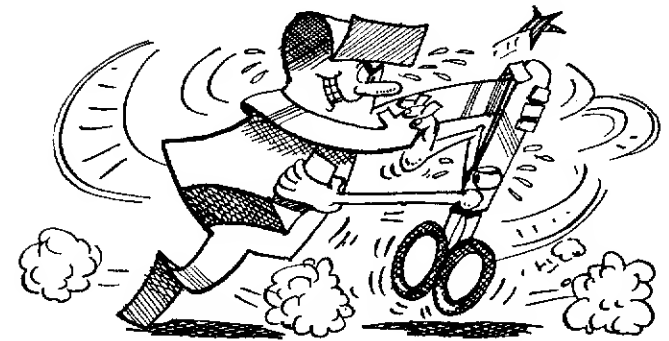
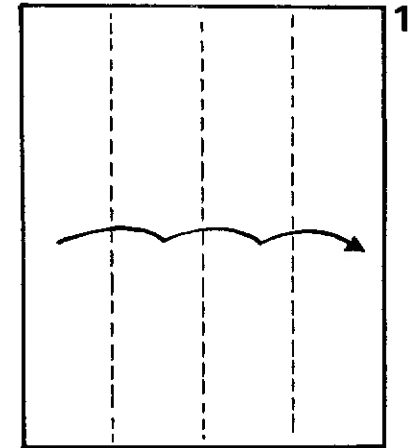
## TOYS THAT TWIST AND TURN

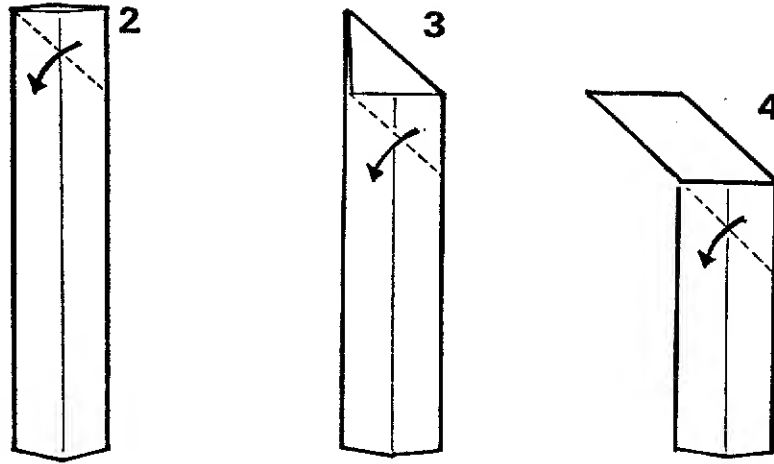


### Pop-up snake

You will need: *three or four sheets of paper (20 × 25 cm)*  
*glue*  
*screw-top jar*

1 Take one sheet of paper and find its centre line by folding the longer edges together. Open up and fold the same two edges to the centre crease. Open up again and fold the left edge over and over as shown to make a flat tube.

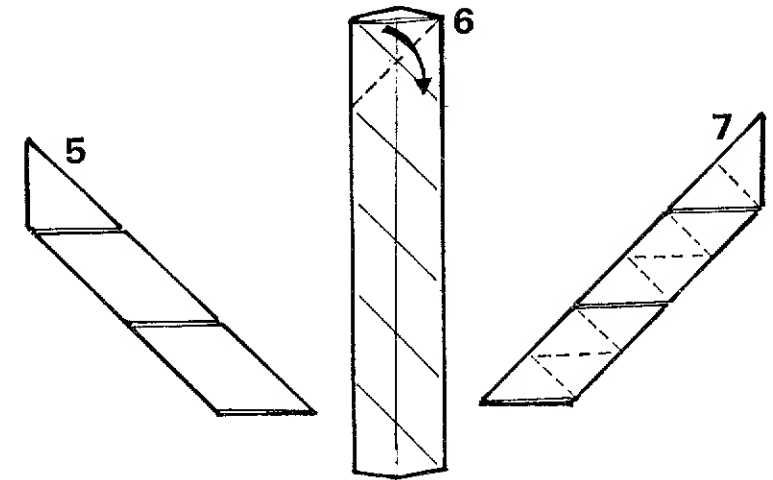
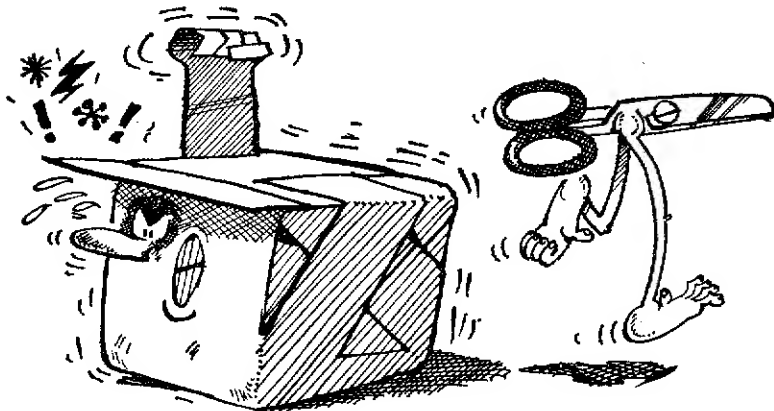




2 Fold the longer edges together to find the centre line. Open up and fold the top edge so that it lies along the left edge.

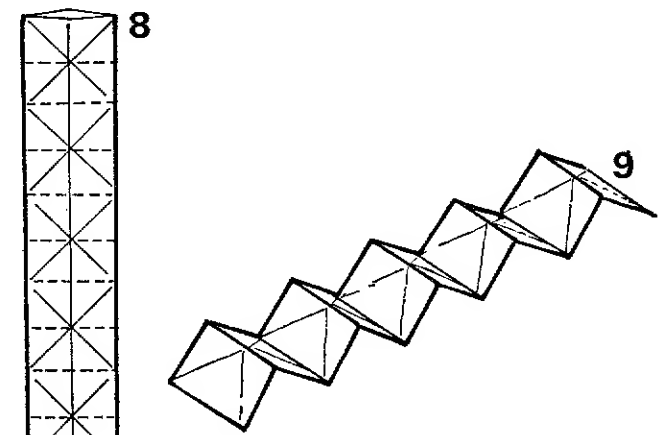
3 Now fold the horizontal edge to the left edge . . .

4 . . . and again, until you reach the shape illustrated in fig. 5. Then open up.

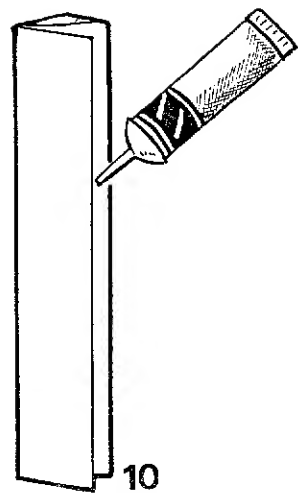


6 You now have a series of equally spaced diagonal creases running down the paper. Make a second series to cross the first; start by folding the top edge to the right edge and continue in the same way until the shape illustrated in fig. 7 is reached. Then open up.

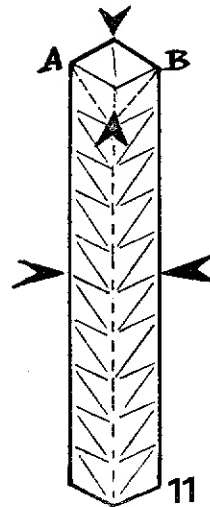
8 Make a series of equally spaced horizontal creases by pleating (see fig. 9). Then open up.





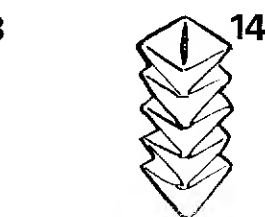
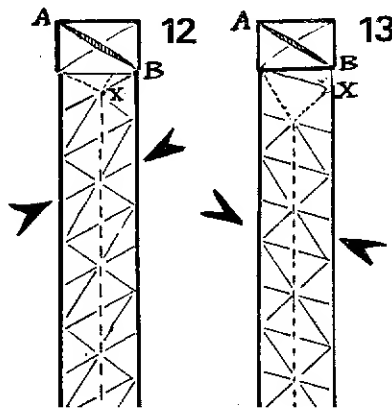


10 Glue the top layer to the layer beneath. Then raise the sides of the tube.



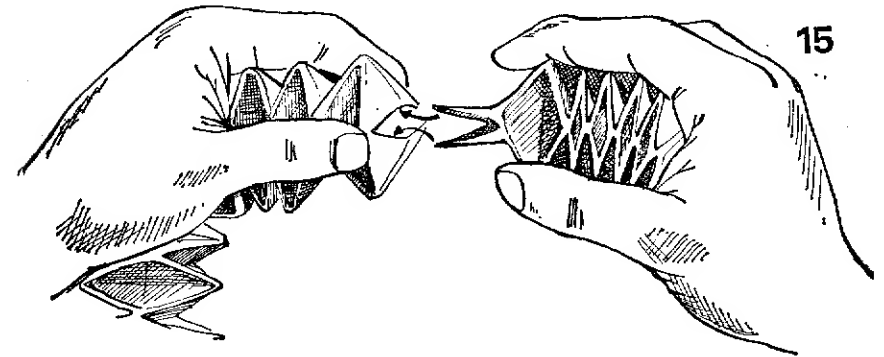
11 Now start to form concertina folds using the creases which are already in place. First push in the two top V-like sections and then flatten the tube (it helps to insert a ruler). Points A and B can now be pinched into a horizontal position.

12 Squeeze the sides to re-form the tube and immediately flatten the other way. Watch point X.

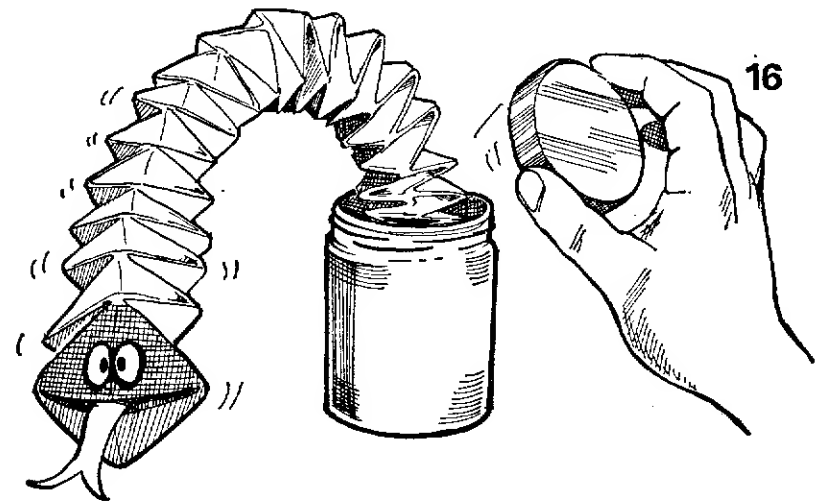


13 Squeeze the sides again to create the next concertina fold. Continue in this way until the whole length of the tube is folded (fig. 14).

15 Make two or three more concertina sections as shown in steps 1-14 and link them together by raising two points at the end of one section and inserting them into the two 'pockets' of another section. A spot of glue will help to hold them together. This forms your snake.



16 Finish off by drawing in his eyes. A small scrap of paper will make a tongue. Compress the snake into a jar or box. When the top is removed the snake will pop out.

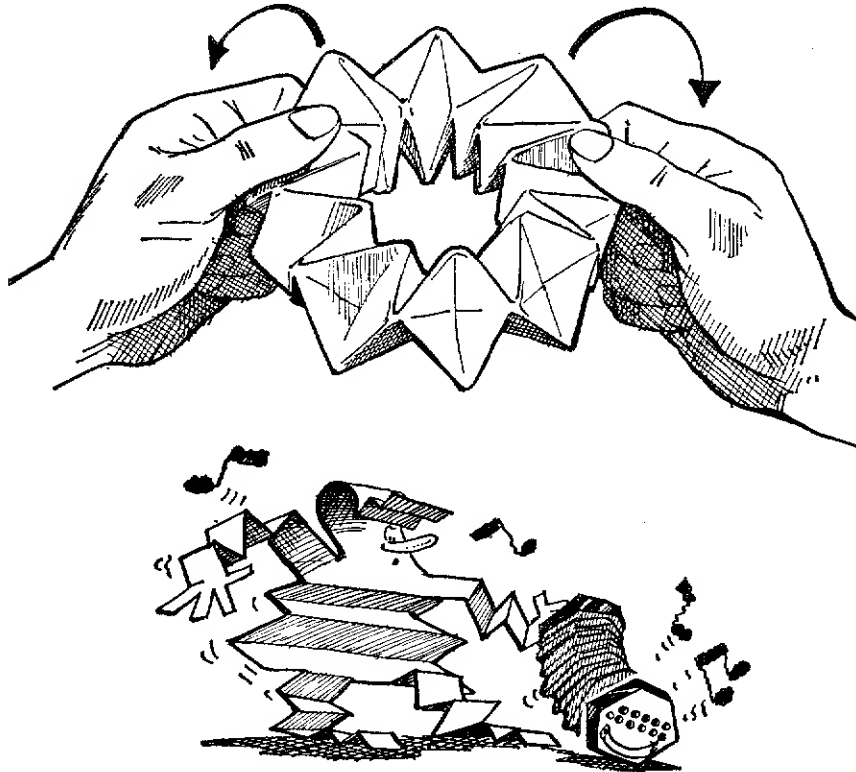


## Flexagon

You will need: *two sections of the pop-up snake (shown on page 73) made from  $20 \times 25$  cm sheets of fancy wrapping paper*

Join two sections of the pop-up snake as shown on page 73, then join the two ends together in the same way. This makes a sort of doughnut shape which is called a flexagon.

Push the sides down and the centre spreads outwards, changing its shape. Keep on twisting the flexagon into itself and watch the changing pattern of its surfaces.



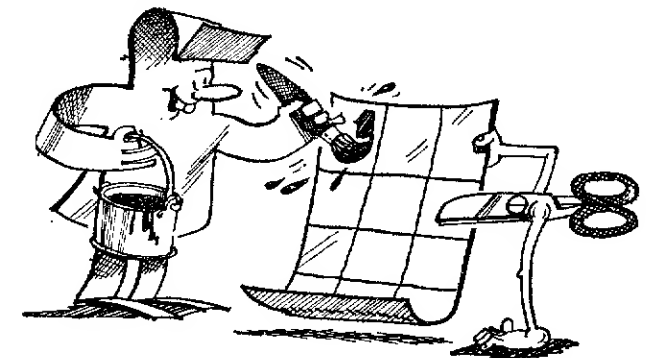
## Magic pictures

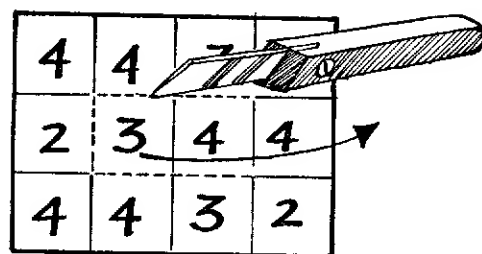
You will need: *paper ( $7.5 \times 10$  cm)  
pencil and ruler  
scissors or craft knife  
sticky tape  
glue*

1 Mark intervals of 2.5 cm along the edges of the paper. Join the points together to divide the sheet into twelve 2.5 cm squares. Then mark each square with a number as shown. Turn the paper over, keeping it the same way up.

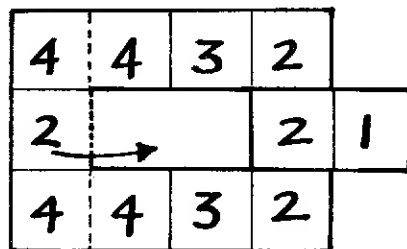
2 Divide the reverse side similarly into twelve squares and number as shown.

7.5cm	1	1	2	3	↻	4	4	3	2
	3	2	1	1		2	3	4	4
	1	1	2	3		4	4	3	2
10cm									

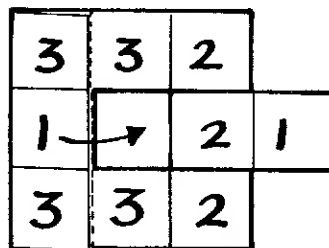




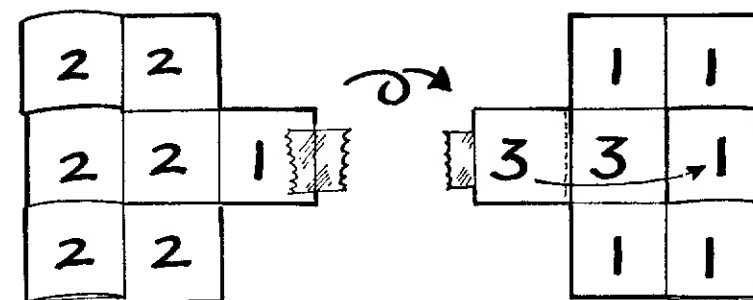
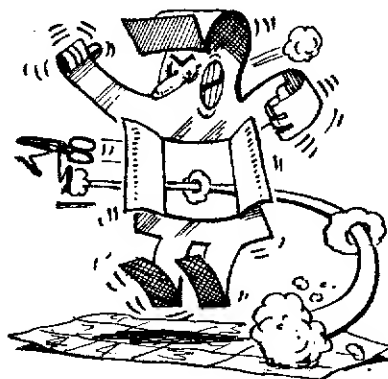
3 Now cut neatly along the broken line to make a rectangular flap. Fold this to the right.



4 Fold the left edge of the paper to the centre ...



5 ... and fold again.

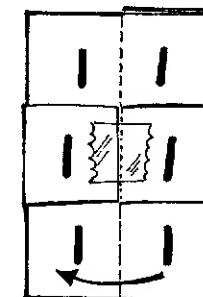


6 Stick a piece of adhesive tape to the end of the projecting flap. Turn over ...

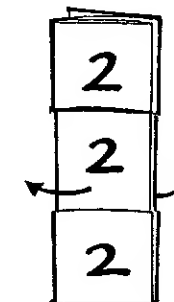
7 ... and fold the flap to the right fixing it firmly to the square behind the window.

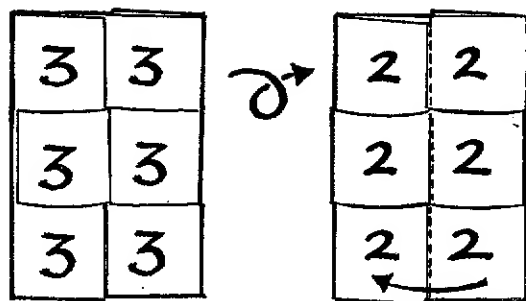
8 This is the basic construction completed.

You will notice that the front surface has six squares each marked with a 'one'. Fold in half from right to left.



9 Separate the two layers at the right ...

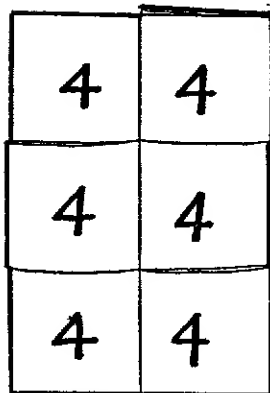
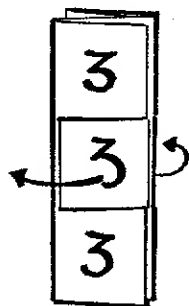




10 ... and the new surface is marked with 'threes'. Turn over.

11 This surface is marked with 'twos'. Fold in half from right to left.

12 Separate the layers at the right again ...



13 ... and we have a complete set of 'fours'.

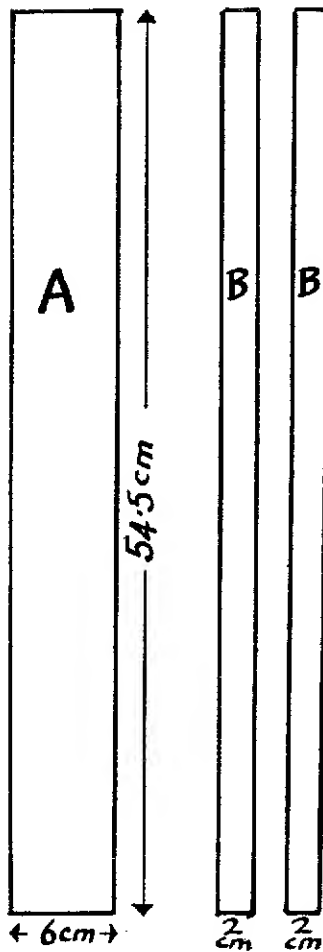


14 Having done this, it is possible to cut up four pictures and stick the pieces to these squares so that two pictures are on show – at front and back – and the other two hidden. The problem for your friends will be to find the hidden pictures.

Cut a set of four pictures of suitable size from a magazine (portraits of favourite pop singers or sportsmen and women make suitable subjects) and trim them into  $7.5 \times 5$  cm rectangles. Call the pictures no. 1, no. 2, etc. Cut picture no. 1 into six  $2.5$  cm squares. Return the toy to the position in which all the 'ones' are visible, and carefully stick each piece of picture no. 1 into its appropriate square so that the complete picture is reassembled. Cut and stick the other three pictures in the same way.

## More magic pictures

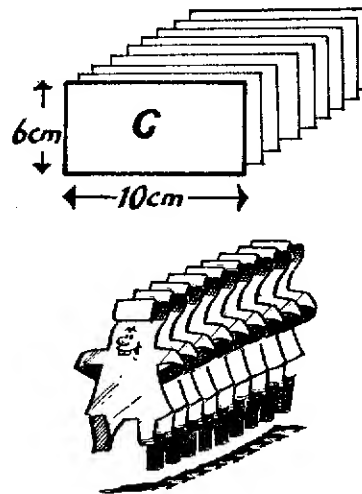
You will need: *drawing paper*  
*pencil and ruler*  
*scissors or craft knife*  
*glue*



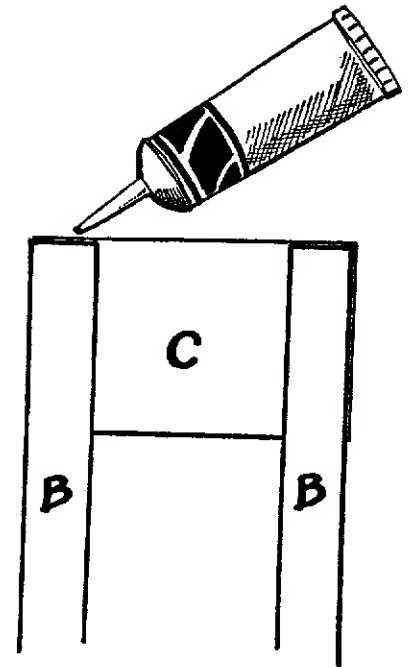
1 Cut out a strip of paper,  $6 \times 54.5$  cm (marked A in the drawing).

Cut out two strips of paper,  $2 \times 54.5$  cm (marked B). You may need to stick two pieces together to make such long strips.

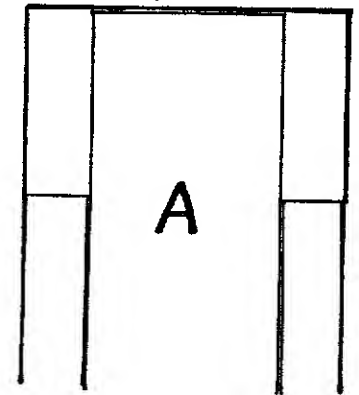
Cut out nine rectangles of paper,  $6 \times 10$  cm (marked C).

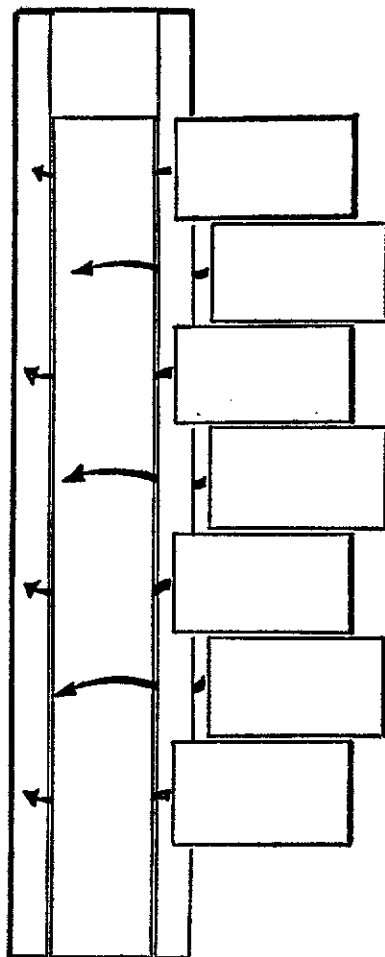


2 Take the two narrow strips B and glue one end of each to one rectangle C as shown. Make sure that the edges of the strips are flush with the edges of the rectangle. Then turn over.



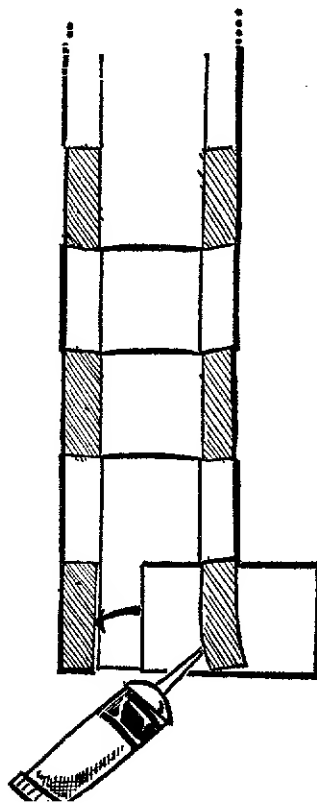
3 Glue strip A to the reverse side of the rectangle, making sure that the top edges of both are flush. Strip A should lie exactly between strips B.





4 Now weave the remaining rectangles into position. The first one should lie over strips B but under strip A; the next one under strips B but over strip A and so on alternately. *Do not glue.*

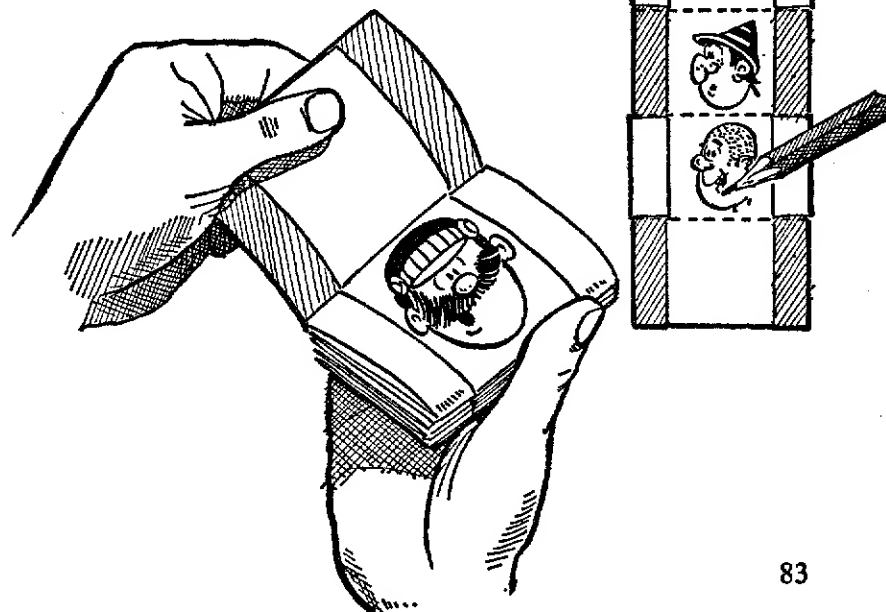
5 Slip the final rectangle into place. This one you should glue in the way that the first rectangle was glued.



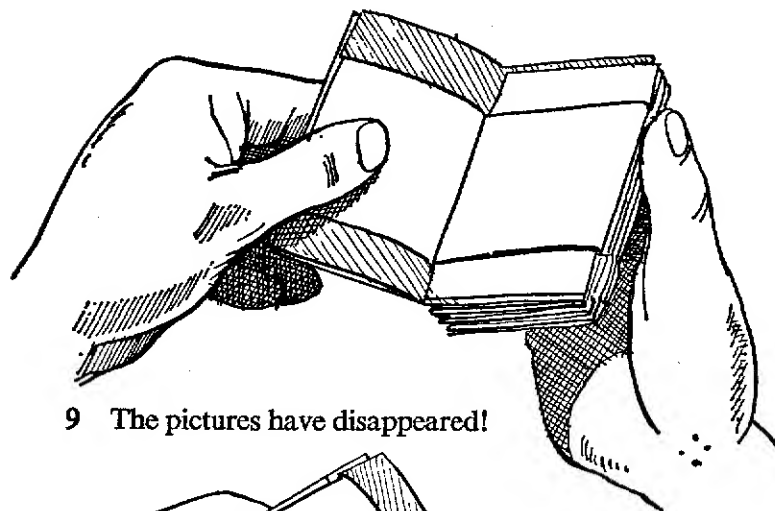
6 You now have a chain of nine squares. Draw a series of pictures, one on each square except for the end squares, or use pictures cut from a magazine if you prefer.

Then pleat the whole thing, neatly folding backwards and forwards on the lines shown.

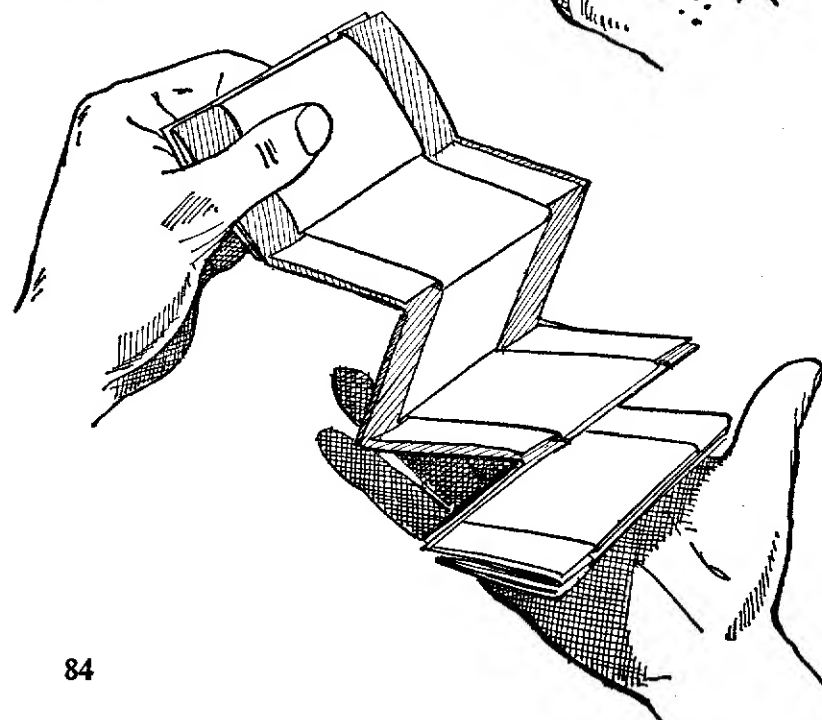
7 This makes a folder of pictures ready to show to your friends. Raise the first layer as if you were opening a book. Lift it and let the folder fall open naturally. There are the pictures you drew – as you would expect.



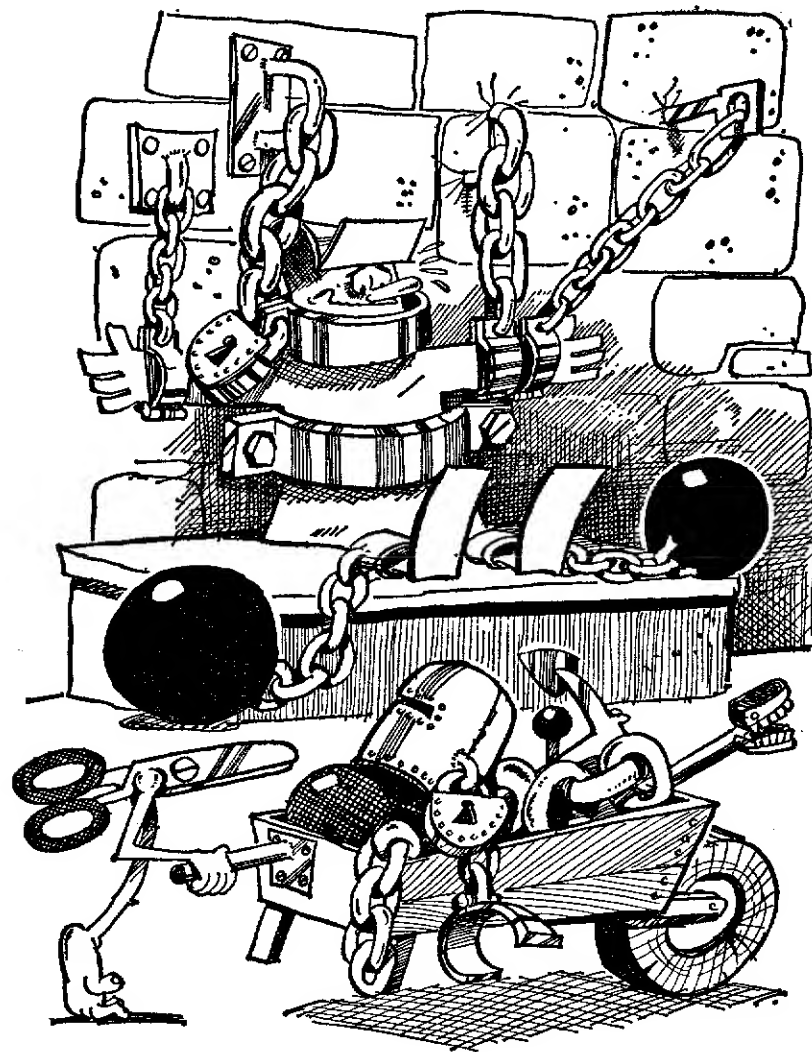
8 Close the folder again. This time take hold of two layers and let the folder fall open.



9 The pictures have disappeared!



## THINGS TO WEAR

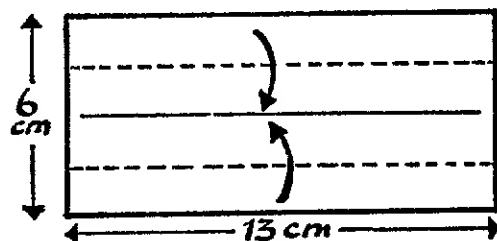


## Bracelet

You will need: *several pages from a magazine*  
*pencil and ruler*  
*scissors or craft knife*

1 Cut out at least twenty  $6 \times 13$  cm rectangles of paper (by cutting through the pages of a magazine you can prepare several rectangles at once).

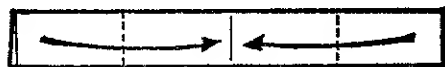
Take one of these rectangles and fold both pairs of edges together in turn to make the centre creases. Open up and fold the two longer edges to the centre.



2 Fold the top to the bottom.



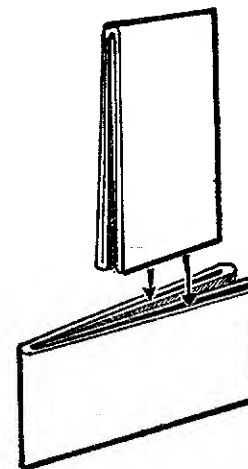
3 Fold the two sides to the centre.



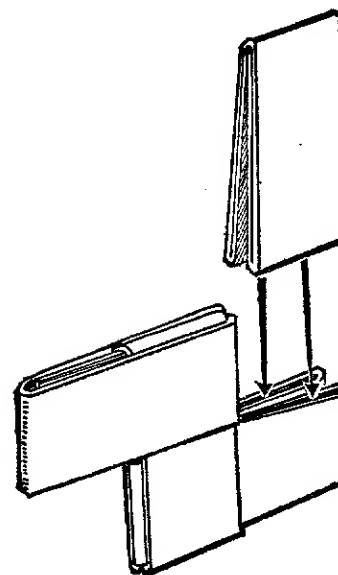
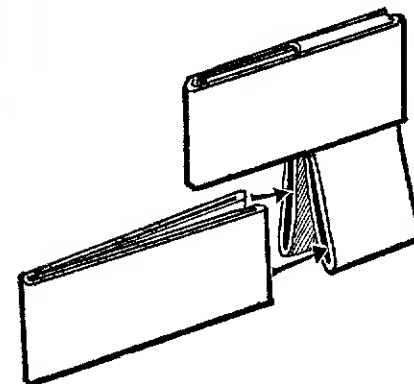
4 Fold in half from right to left. This completes one link of the bracelet. Make more links by treating the other rectangles of paper in the same way.



5 Push the two folded ends of one link through the loops of another.



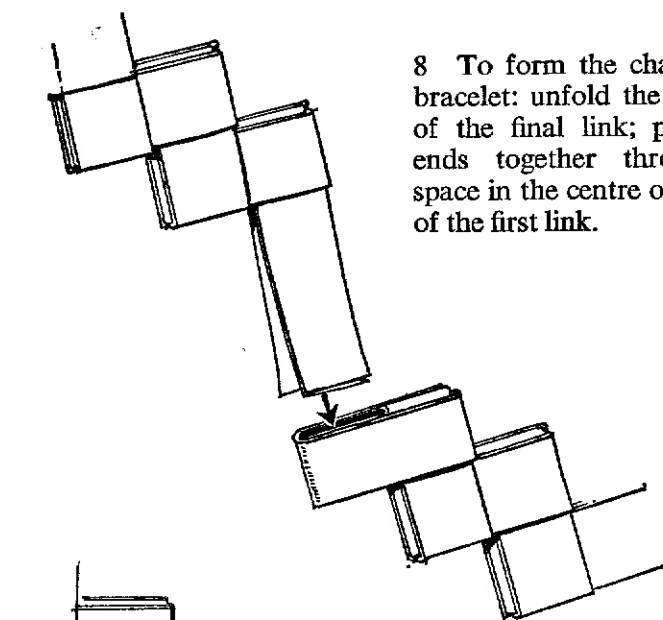
6 Then push the ends of a third link through the loops of the second ...



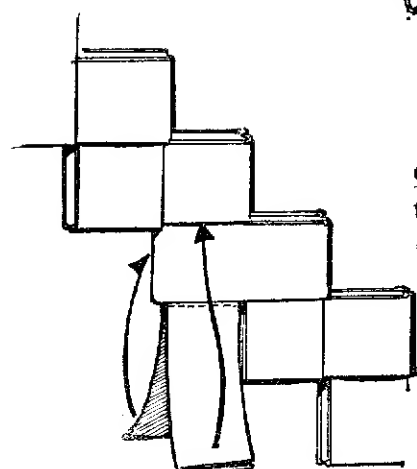
7 ... and so on. Continue in this way until you have joined about twenty links.



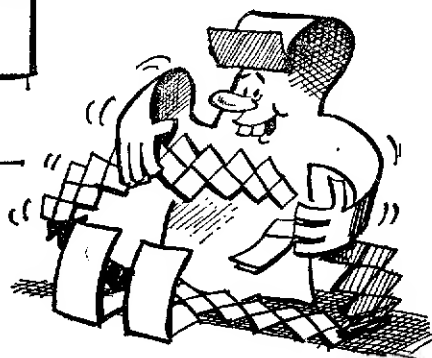




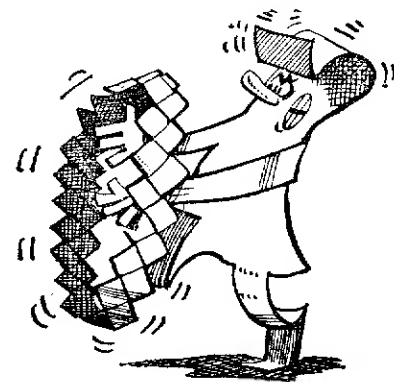
8 To form the chain into a bracelet: unfold the two ends of the final link; pass these ends together through the space in the centre of the loop of the first link.



9 Bring the ends up and tuck them into the pockets on either side to complete the bracelet.



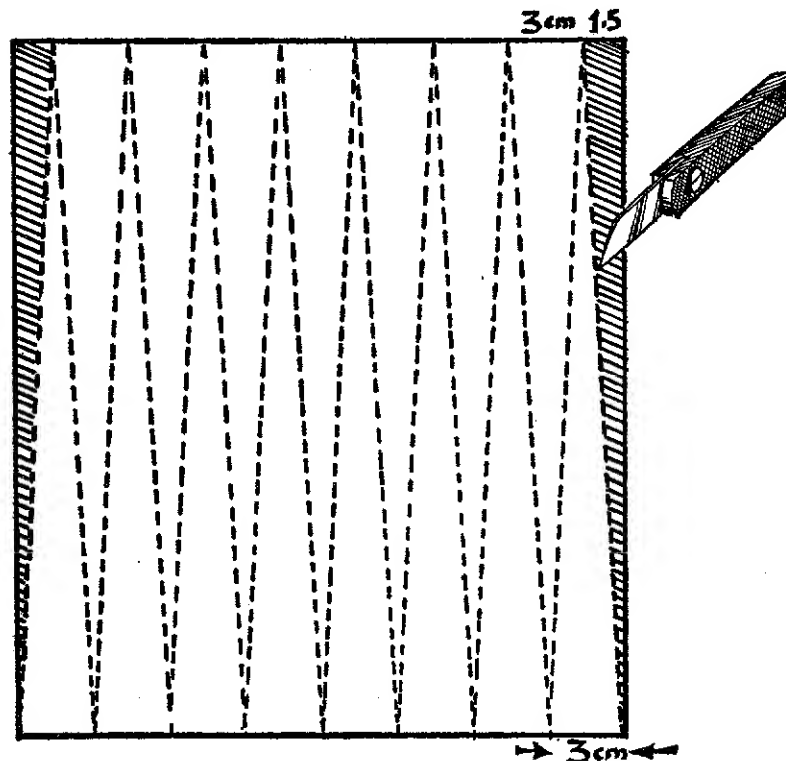
10 You can wear the bracelet on your wrist or, with more links added, as a headband. With still more links you can make a belt.



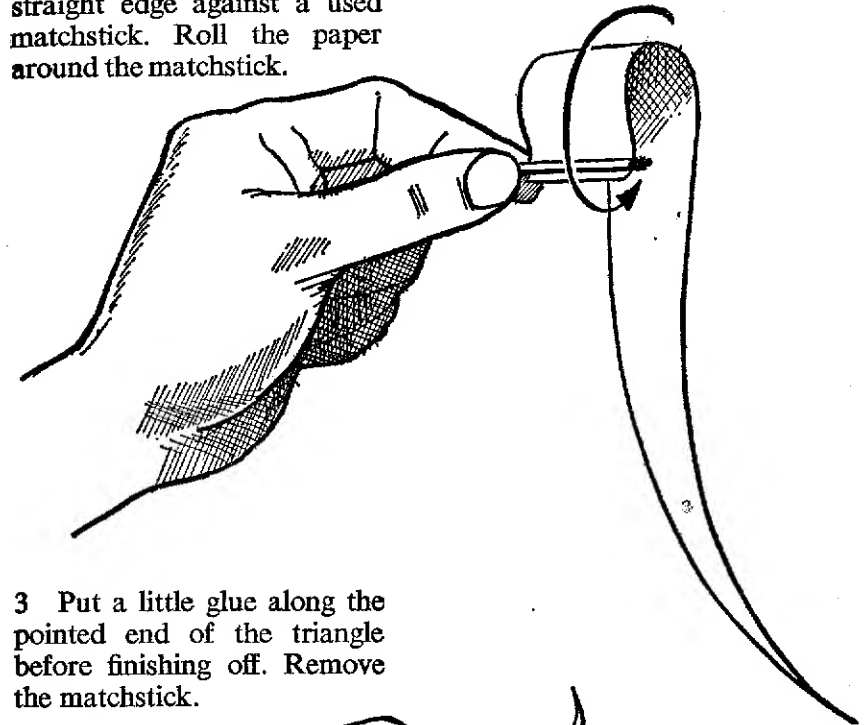
## String of beads

You will need: *a page from a magazine (at least  $24 \times 30$  cm)*  
*pencil and ruler*  
*scissors or craft knife*  
*needle and thread*  
*used matchstick*  
*glue*

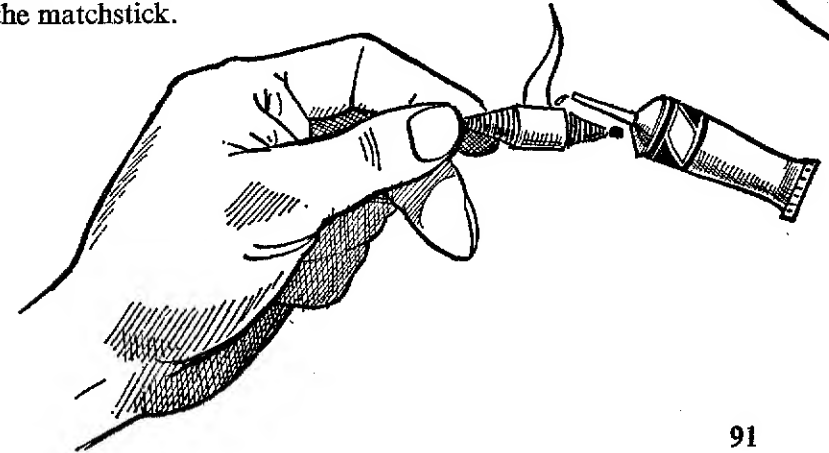
1 Cut out a rectangle of paper  $24 \times 30$  cm from the page of a magazine. Mark the lower (short) edge at 3 cm intervals. At the top, measure in 1.5 cm from the left and mark at 3 cm intervals from that point. Join up all these points to make a series of elongated triangles. Cut these out, discarding the two half-sized pieces at the sides of the page.

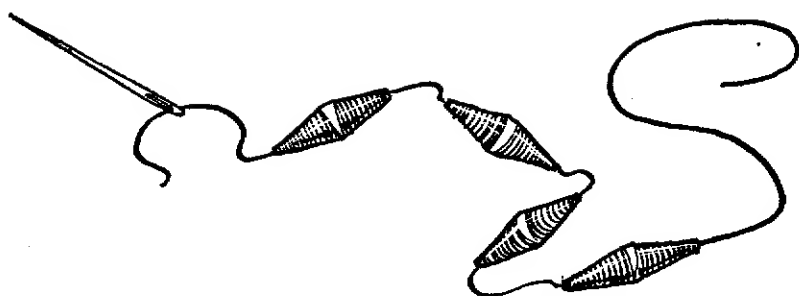


2 Take one of the paper triangles and place the short, straight edge against a used matchstick. Roll the paper around the matchstick.



3 Put a little glue along the pointed end of the triangle before finishing off. Remove the matchstick.



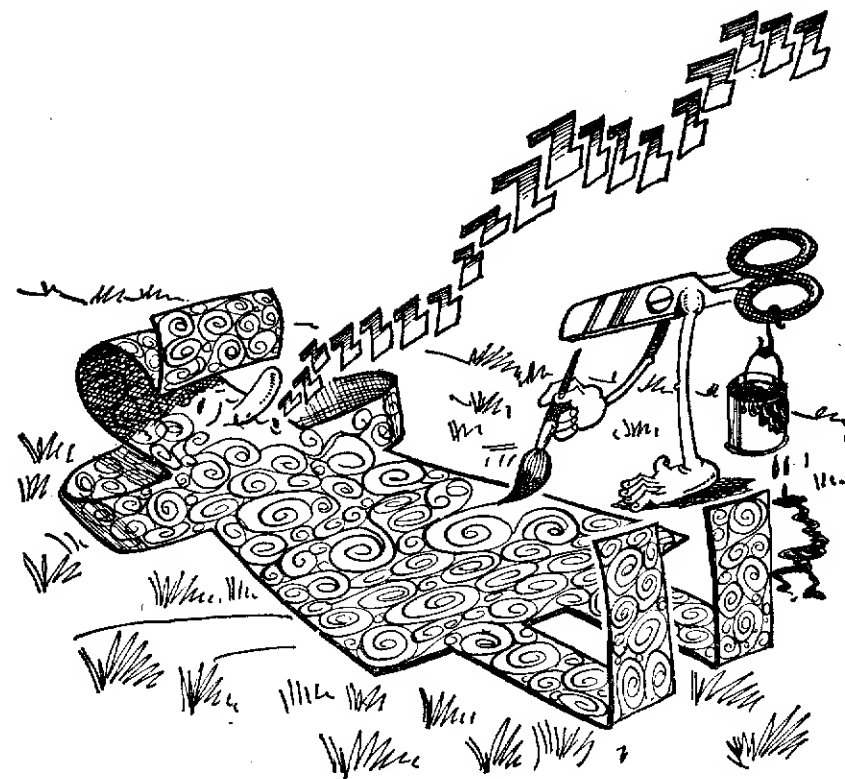


4 Make more beads in the same way and join them with needle and thread.

5 Tie the ends of the thread to complete the string of beads. Wear it around your neck.



## DECORATIONS



## Totem pole

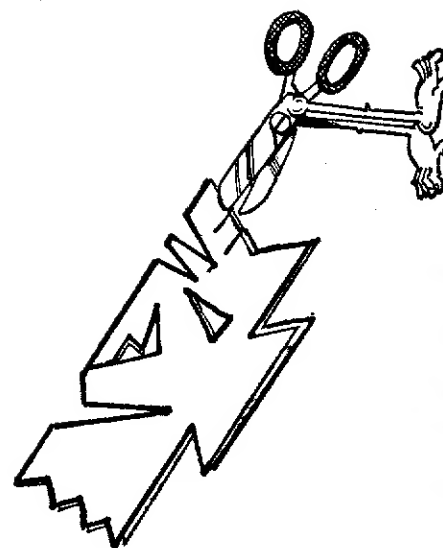
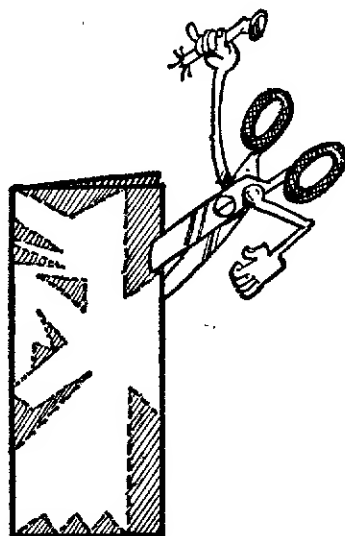
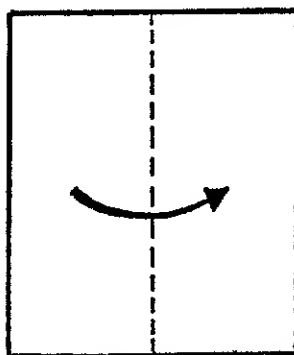
You will need: *one sheet of paper*  
*scissors or craft knife*

Cut the sheet of paper into four quarters

- 1 Take one of the four pieces and fold two edges together, either lengthways or widthways.
- 2 Treating the folded edge as the centre, make a series of cuts through the two layers of paper to create a grotesque mask.

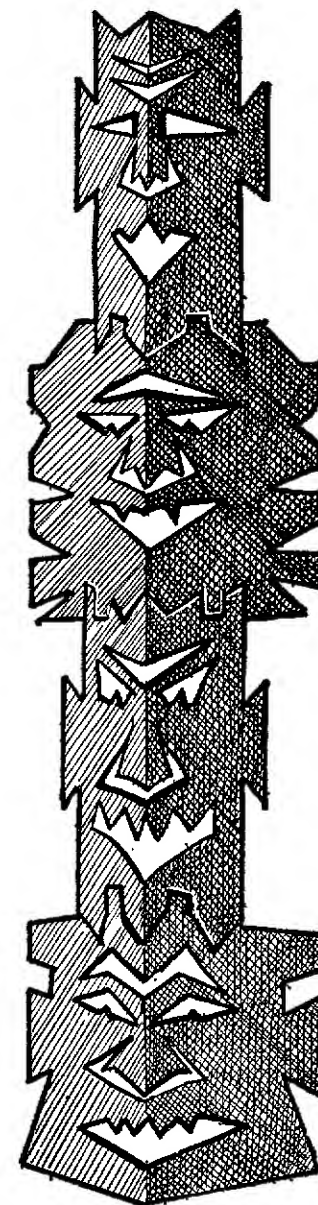
As well as a mouth, nose, eyes and ears, you can cut out a beard, horns, tusks, wrinkles in the forehead and lines in the cheeks.

Discard the shaded areas.



- 3 Cut a small vertical slit through both layers at the top of the mask. Make more masks from the remaining three pieces of paper. Fold some of the pieces widthways and some lengthways so that your masks are not all of the same height and width.

- 4 Slot the masks into each other to form a totem pole. By using more sheets of paper you can build up the pole as high as you like.

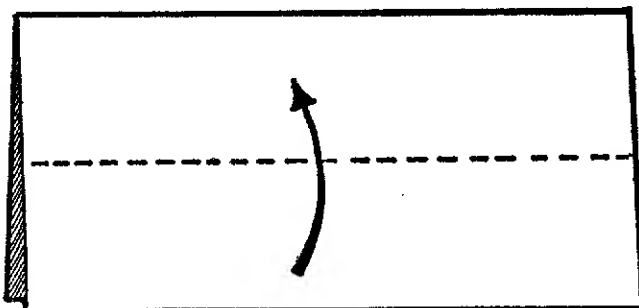


## Cut-out repeat patterns

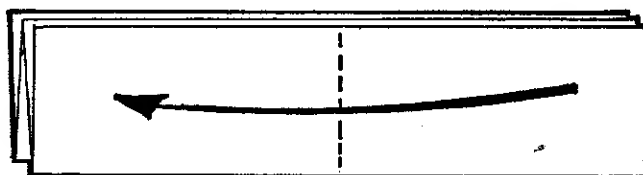
You will need: *squares of paper (newspaper will do)*  
*scissors or craft knife*

Fold the square of paper in half.

- 1 Fold the top layer of the bottom edge up to the folded edge. Turn over and do the same behind.

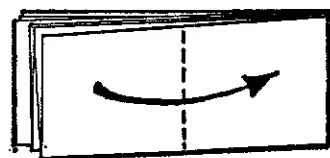


- 2 Fold the right edge to the left edge.

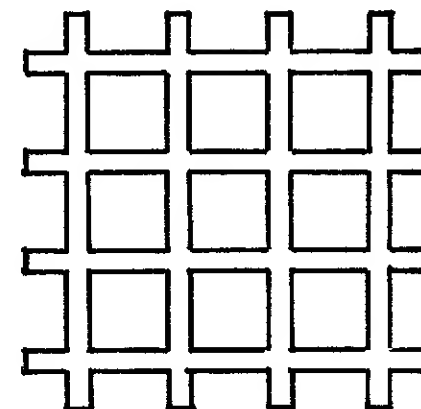
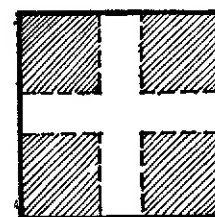


- 3 Fold the top layer of the left edge to the folded edge. Turn over and do the same behind.

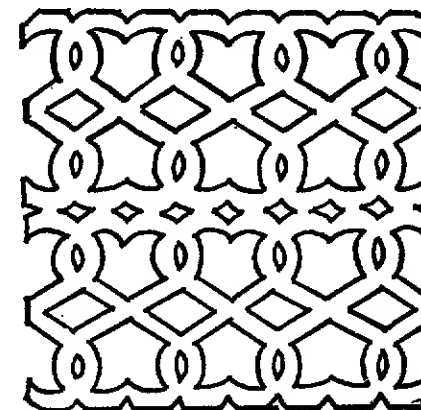
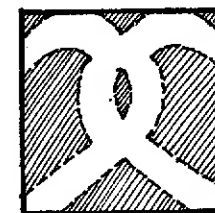
This gives you a little square of paper of sixteen layers. By cutting into this shape and unfolding, you can discover many interesting patterns.



- 4 Simply cutting away each corner of the little square, for example, creates a grille pattern.



- 5 By cutting these two curves you will achieve a more complex pattern.

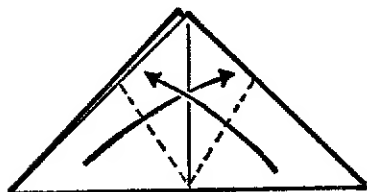


Experiment in this way and when you find a pattern which you like make several similar ones. You can stick these together to decorate the cover of a book, or perhaps even to decorate a wall.

## Six-pointed snowflake patterns

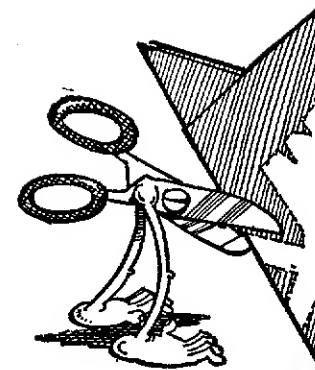
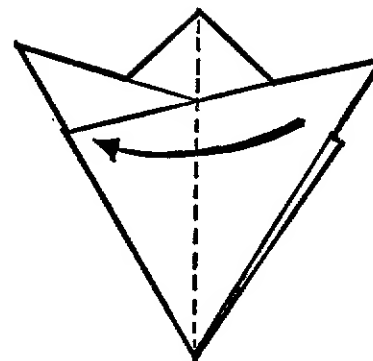
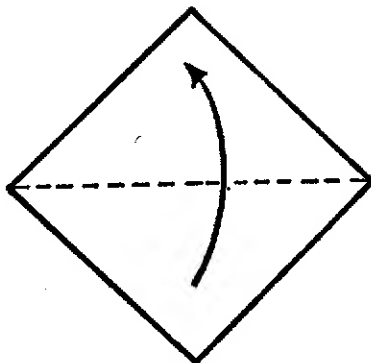
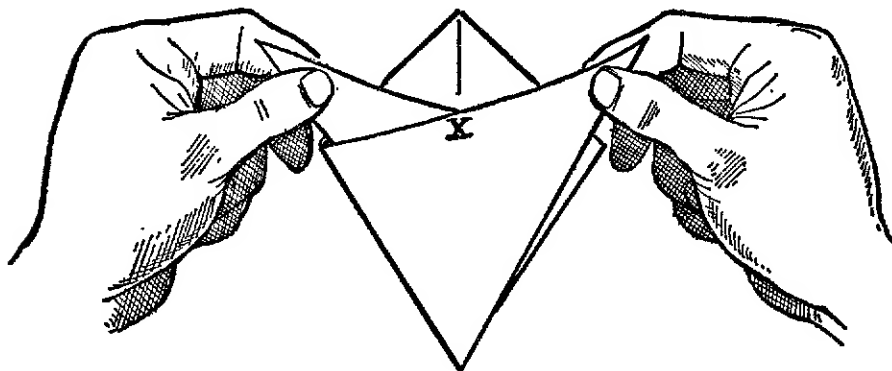
You will need: *squares of paper (newspaper will do)*  
*scissors or craft knife*

1 Take one square of paper and fold two opposite points together to make a crease. Open up again. Fold the other two points together and leave folded.



2 Making sure that the creases start from the centre of the folded edge, bring the two side points forward to lie across each other.

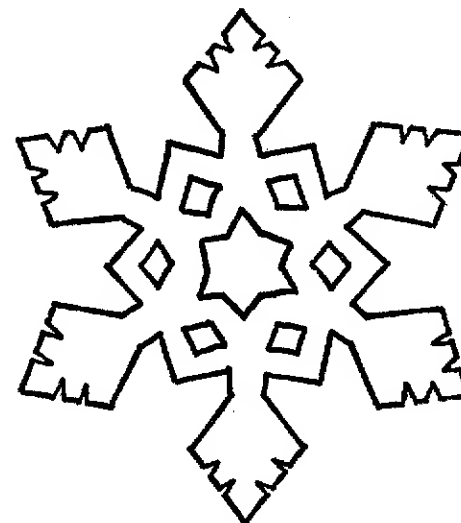
3 Carefully pull the points apart so that the angle where the edges of the two flaps meet (point X) is in line with the vertical centre crease. Now crease firmly.



4 Fold in half from right to left.

5 Make cuts through all layers, discarding the shaded area, and unfold.

6 The six-pointed pattern completed. A number of patterns made by folding in the same way, but with differently positioned cuts, can look most attractive when hung in the form of a mobile.



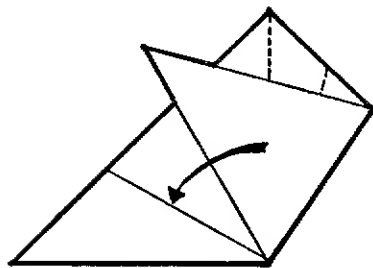
## Five-pointed stars

You will need: *squares of paper (newspaper will do)* ,  
*scissors or craft knife*

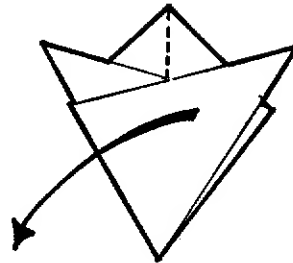
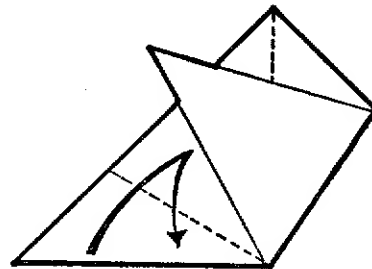
There is an element of mystery in creating a regular five-pointed shape just by folding and cutting a four-sided sheet of paper. So, even though it is easier to make four-pointed or eight-pointed shapes, you may like to tackle these more unexpected five-pointed ones. Here is one way of doing it.

1 Fold a square of paper into the shape shown on page 98; then bring the top flap down.

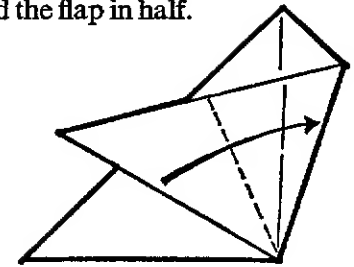
2 Fold the bottom edge to the diagonal edge. Make a crease and open flat again.



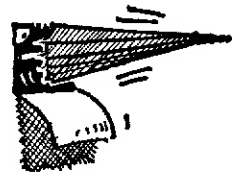
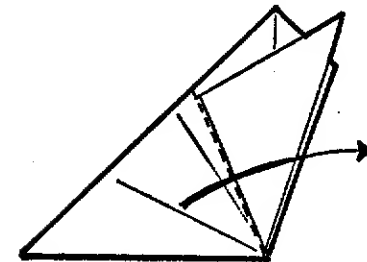
3 Now re-position the triangular flap so that its lower edge lies along the crease made in the previous step.



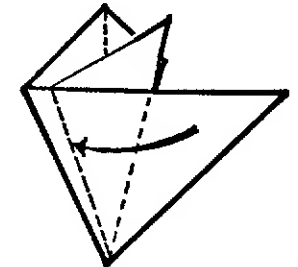
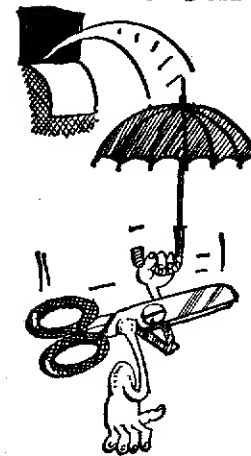
4 Fold the flap in half.



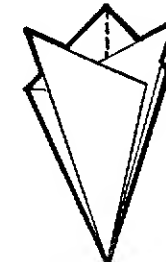
5 Fold the left point across the folded edge.

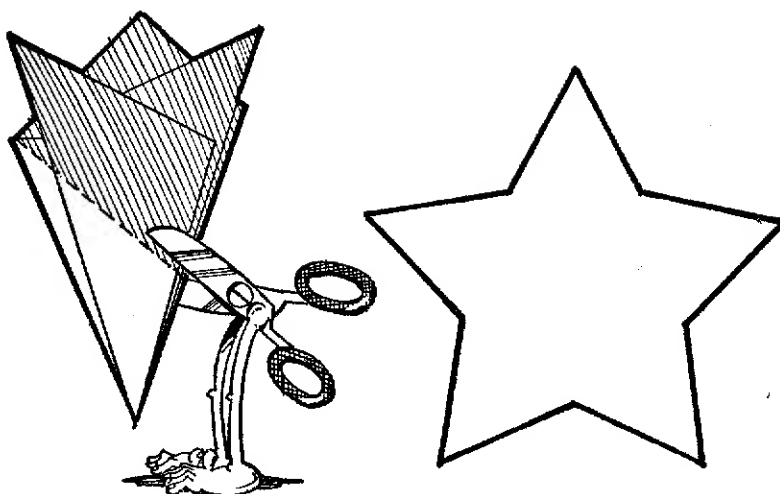


6 Fold the point to the left.



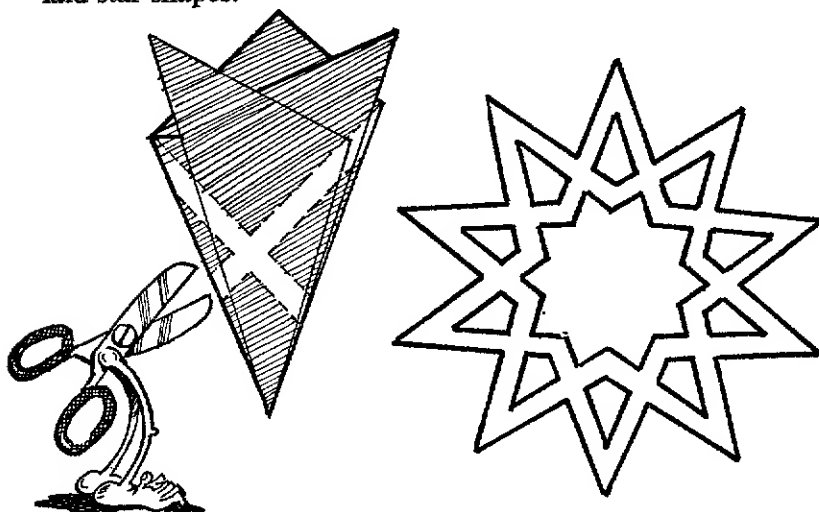
7 This is the shape ready for cutting.





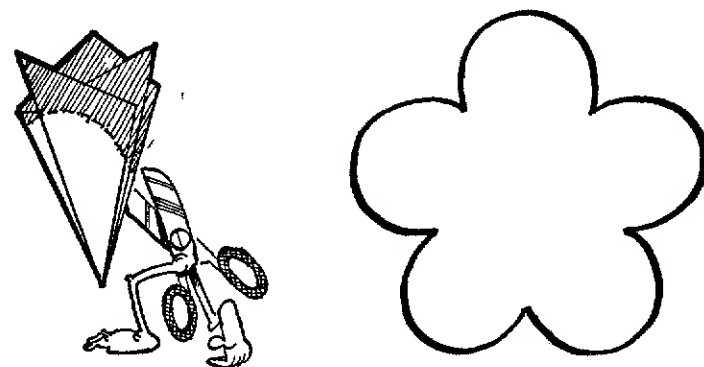
8 By making one cut like this you create a simple, five-pointed star shape.

9 By introducing more cuts like this you create several overlaid star shapes.



## Five-petalled flowers

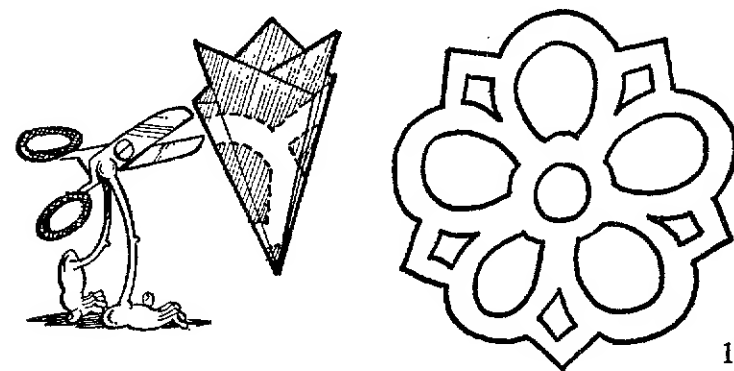
1 Cutting a curved line into the shape shown on page 101 produces a simple flower.



2 Extra cuts produce combined petal and leaf shapes. Experiment with cutting shapes of this kind. Try overlapping two or three shapes to get more complex designs.

Cut-out patterns such as these can be made from small or large squares of paper. Small patterns are useful for decorating envelopes or for making greetings cards when glued to folded sheets of paper.

Much larger cut-outs can be made into a wall-frieze for your bedroom.





## Honeycomb paper ball

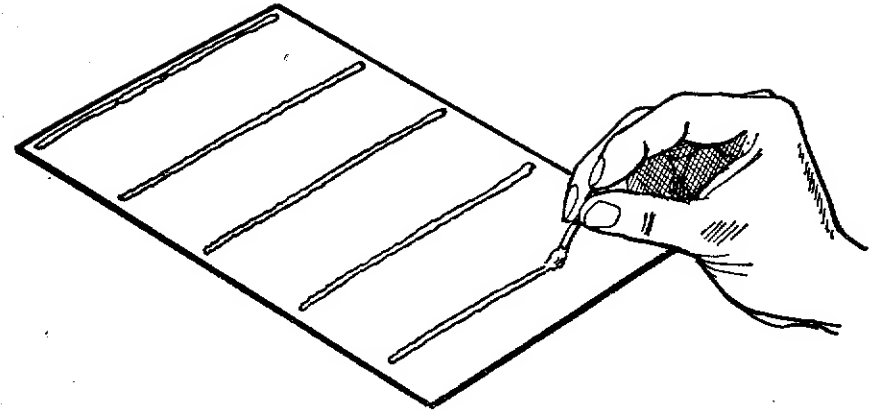
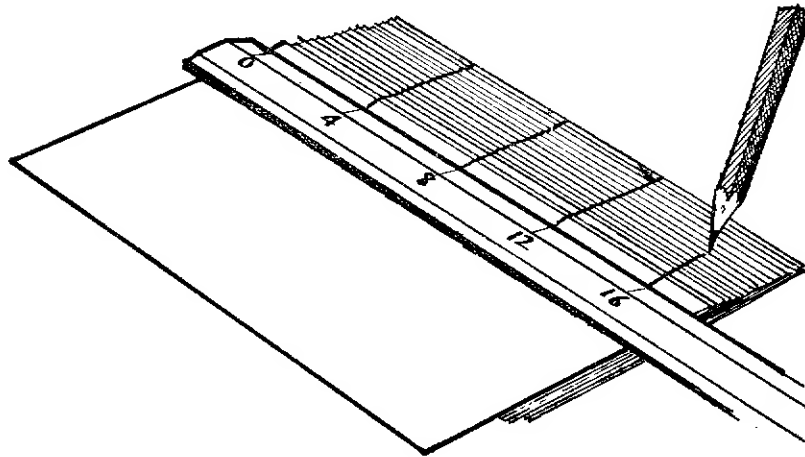
You will need: *one old magazine (about 25 × 30 cm)*  
*thin card*  
*pencil and ruler*  
*scissors or craft knife*  
*pair of compasses*  
*glue and sticky tape*  
*used matchstick*

1 Prepare sixty rectangles of paper, about 10 × 18 cm. To do this quickly, tear twenty pages from a magazine, then cut the batch of pages into thirds widthways. Reduce the longer side to 18 cm by trimming the paper.

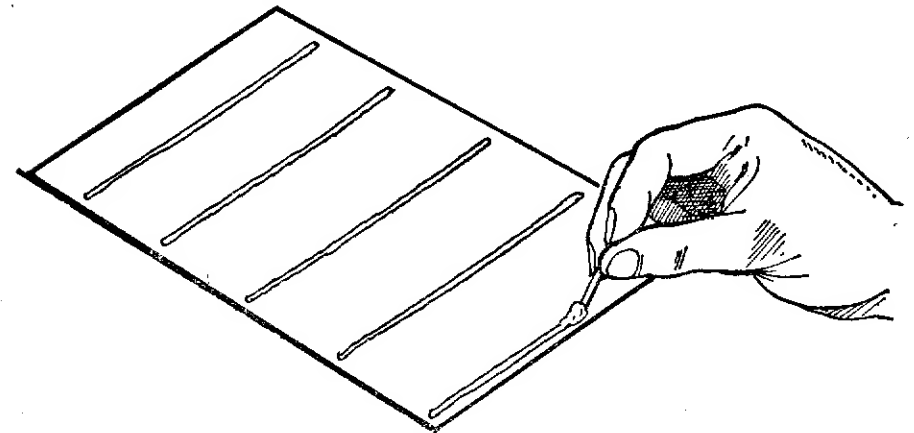
Overlap the sheets so that a little of each is showing along the longer side. Measure off at 4 cm intervals from the left short edge; the last interval will be only 2 cm.

Draw lines across all the edges so that each sheet is marked at 4 cm intervals plus one 2 cm interval at the right.

You may not be able to mark all of the sheets together in this way. Work with batches of paper that you can handle most comfortably.

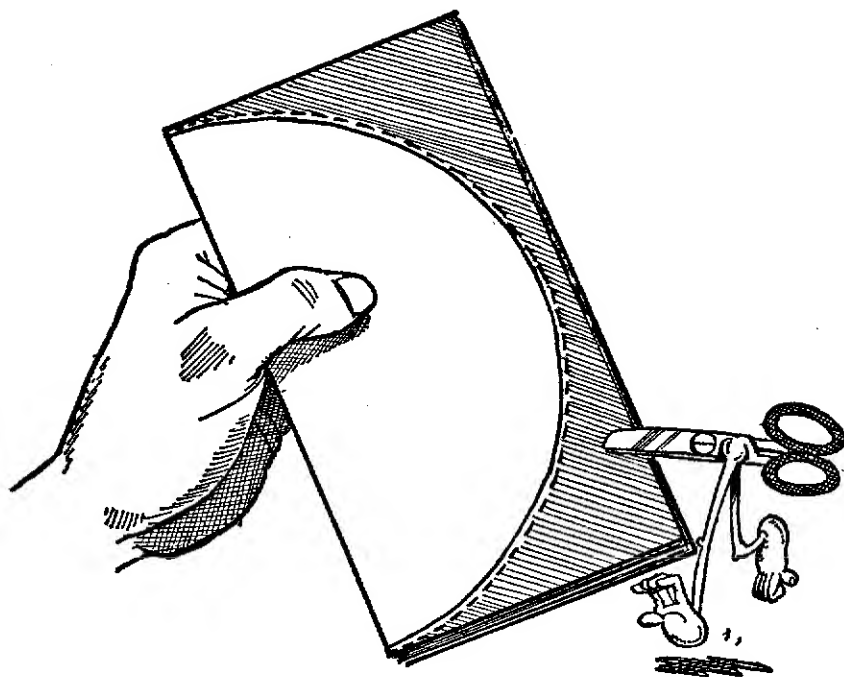


2 Take one sheet and run a line of glue along the left edge. (Use a matchstick unless your glue has a thin nozzle attachment.) Run a further line of glue across the sheet from each of the 4 cm marks.



3 Take the second sheet and *turn it around so that the 2 cm mark is at the left*. Now lay it on top of the first sheet. Run a line of glue along the right edge and then across from each mark.

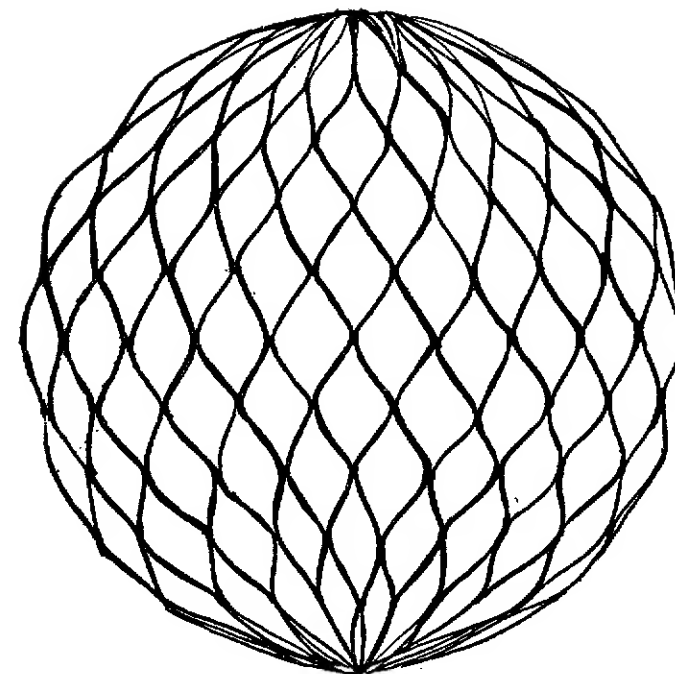
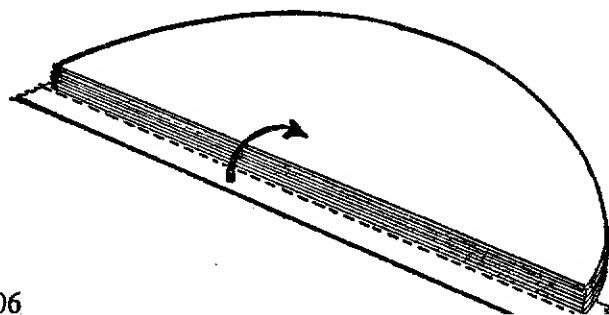
Continue sticking the sheets together, remembering to turn every second sheet around so that the lines of glue between them alternate rather like bricks in a wall.



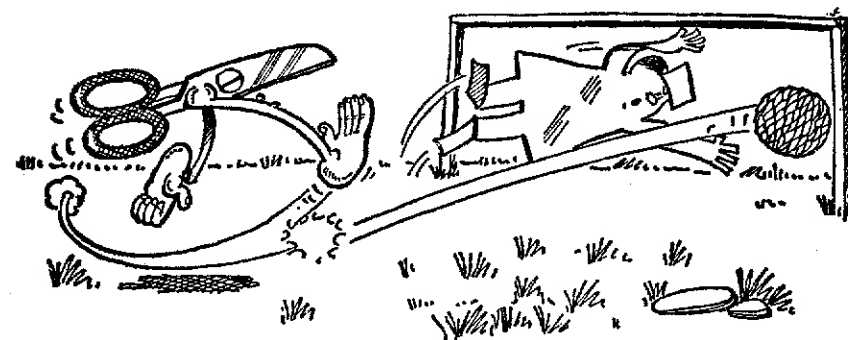
4 When all sixty sheets are glued together, draw a circle with a 9 cm radius on the card. Draw a line through the centre point and cut out the two half-circles.

Place one of these half-circles on the glued sheets, edge to edge, and cut through the sheets around it.

5 Glue the half-circles of card to top and bottom of the sheets. Then stick adhesive tape along the spine to make a sort of book.



6 Open up the book and the sheets will separate into a honeycomb design. Bring the two covers together behind and the decoration will take the form of a ball. Fasten with sticky tape behind so that the ball will keep its form.



### More honeycomb decorations

Instead of using two half-circles of card (as described on page 106), cut other shapes to produce a variety of honeycomb forms.

The bell decoration is constructed in the same way as the ball except that two half-bell shapes are used instead of half-circles. The Christmas tree combines two simple shapes joined by a strip of card. The fish is constructed from two half-opened oval forms, glued back to back, with card shapes added to represent fins and tail.

